The Builder.

VOL. LI. No. 2272. SATURDAY, AUGUST 21, 1886.

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A History of Stained Glass.

THIS subject has been taken up by comparatively few writers, and all those who have dealt with it have had or have developed a degree of enthusiasm in regard to it which it is easy, in one sense, to understand, but which readers who are not penetrated by any special sympathy with things Mediæval may find it difficult sometimes to fully adopt. The subject is, for one thing, peculiarly difficult to adequately illustrate. Few persons, in contemplating a fine window of the great period of Mediæval art, really regard the work from the point of view of pictorial design and expression, as they would regard a painting, for instance, of the great period of Renaissance art. It is the glowing and splendid effect of rich colour as seen by transmitted light, the magnificently decorative character of the work in connexion with the architecture which enshrines it and of which it seems almost to form a part, which enchains the sense of the spectator, and leaves him little room for the same kind of critical estimate of the figure design, which he might indulge in looking at the colder tones of an easel painting or a fresco. At the same time, it is this special quality of colour effect which it is impossible to reproduce in any illustration, least of all in any illustration such as can be multiplied for publication. Water-colour may reproduce a certain amount of the effect of the original, when deftly handled with that special object, and omitting every other pictorial consideration, of which we have seen one or two exceptionally successful examples in a recent exhibition at the Gallery of the Fine Art Society, in some of the drawings which were executed under the supervision, or at least at the instigation of, Mr. Ruskin. But when it comes to publication, even such partial success as this is out of the question. Chromolithography, the only available method for giving any multiplied copies of the colour design, may be said to be worse than useless. It will not, except now and then, by a happy chance, give even the right tone of colour of the original; and where it does so, it gives it with a hard dead texture, which is the furthest thing in the world from the scintillating glow of fine glass. The best authors and illustrators on the subject have therefore, as far as we have observed, entirely abandoned the attempt to illustrate the art in this manner in any published works. They confine themselves to illustrations in black and white, giving the design, the comparative contrasts of dark and light, and the leading-up construction,—the latter not an unimportant point in the character and history of stained-glass design. It is better to do this, and to waive all pretext of conveying the colour effect, than to ostensibly attempt it with a process which is only illusory. But then there comes this inevitable drawback to the enthusiasm which is demanded of us, that the subjects are presented to us shorn of the one effect which gives them their real glory in actual existence, and we are left at liberty to judge coldly of the stiffnesses and puerilities of drawing, design, and expression, which we might forget in contemplating their genuine decorative effect *in situ*. A design by Raffaelle retains its essential beauty and expression even when given in an outline engraving. It is possible that to the enthusiastic student of Mediæval stained glass the same is true of these designs when reduced to black and white. But one must certainly be an enthusiast to think so, in many cases at all events. Take one example in the work before us,* that of the "Angel Playing a Harp, from the traceries of Blakeney Church, Norfolk" (plate xxxi., *b*.). Mr. Westlake expresses, we presume, his own genuine opinion when he remarks on the previous page, "Some of the tracery pieces at Blakeney are still filled with angels of the most excellent design and workmanship; they appear to be the work of some Westminster atelier," &c. Now, what does Mr. Westlake mean by this? He draws the figure himself, and he knows what passes for excellent figure design among artists. Here is a stumpy figure five heads high (we have measured it, so there is no doubt about it), with features rudely expressive of a commonplace self-satisfaction (nothing higher, certainly), in a short tunic, from under which project legs with feet drawn anyhow, one of them more like a bear's paw than a foot, with apparently rough trousers on, but these are intended as the nether wings of a seraph ("with twain he covered his face, and with twain he covered his feet, and with twain he did fly†"), as one is enabled to conclude by comparing the bits of fledgings on the shoulders which represent the middle pair of wings. Although modern science keeps the anatomical difficulties of wings on anthropomorphic angels too much before us to allow us the same enjoyment in the idea which our forefathers had, still there is something poetic in the idea of the Biblical six-winged seraph, who is capable (always putting anatomy on one side) of being developed into a piece of very grand decorative design, eminently suitable for stained-glass treatment. But imagine any one not under the domination of Mediæval enthusiasm contemplating this idea of the six-winged seraph as a possible motive for design, and there having put before him as an illustration this bear-paw figure with feathered trousers and stumpy proportions; would he not probably say "this is the attempt of a child, and of a very unimaginative child"? And this, forsooth, is to be called "excellent execution and design"! This is saying the thing which is not.

In fact, the students of Mediæval stained glass acquire, as it seems to us, a set of entirely conventional perceptions in regard to design and drawing. They are so enamoured of their subject that any head or figure which approaches to decent drawing, though it would have no chance of admission at the Royal Academy, becomes in their phraseology "beautiful," "excellent," and even "splendid." Now there is no occasion for this exaggeration, which is inconsistent with a proper standpoint of criticism, and moreover gives great occasion to the adversary to blaspheme; and the subject is quite full of legitimate interest and beauty, without these illegitimate flights of laudation.

Mr. Westlake's third volume deals with the stained glass of the fifteenth century, with numerous illustrations, chiefly taken from English work, and is prefaced by a general introductory chapter, considering, first the general treatment of English figure windows and their details; secondly, subject windows and tracery; thirdly, heraldry; fourthly, foliage ornamentation, quarry work, and grisaille; and, lastly, the character of the material. The change of character of design in the windows with the architectural change to the Perpendicular style is, Mr. Westlake observes, rather behind the architectural change in date; which is what one would expect. The architectural details and their development were partly influenced by constructional questions which would not affect the windows, and the design of the latter, as far as such details as canopy work, foliage, &c., are concerned, followed the architecture at a little distance behind; and, as the author observes, in the later glass of the century the number of pinnaclets which surmount the canopies give the heads of the lights a pretty and animated appearance. This is very well illustrated in the canopy-head from the west window of the Church of St. Martin-le-Grand, York, given in plate xx., a fine example of the use of architectural detail as window decoration, though there is rather more of perspective treatment in the details than is quite in

* A History of Design in Painted Glass. By N. H. J. Westlake, F.S.A. Vol. III. James Parker, London and Oxford. 1886.

† Isaiah vi., 2.

keeping with the notion of stained-glass design. The question of the employment of imitation of architectural detail as a portion of stained glass is one on which something may be said on both sides. Some have objected to it altogether; but, to our thinking, the employment of forms more or less common to the architecture around is one way of harmonising the design of the glass with that of the whole structure, and giving unity of effect; but the architectural details, when so used, should be modified,—treated as suggestions rather than as imitations. The Mediæval artists did this to a great extent by a kind of natural instinct, though not always quite as much as would have been desirable. The introduction of architectural detail into stained glass in Renaissance designs, especially in modern German glass, has usually been very badly and coarsely done, with all kinds of unsuitable perspective effects. Rightly regarded, the modification of architectural details for stained-glass treatment ought to afford a good deal of suggestion for conventional decorative design of a kind suitable to the material.

Mr. Westlake rather questions Winston's characterisation of Perpendicular stained-glass as marked by "delicacy, sometimes even bordering on timidity, and general breadth of effect," giving examples of heads, one especially (the head of Jesse at Margaretting), which is bold and powerful enough. We cannot quite see, for our part, how "delicacy bordering on timidity," is reconcileable with "general breadth of effect," which latter does not seem to us to be the characteristic quality of Perpendicular glass, which is certainly weaker in general effect, though often much more finished in detail than earlier glass. In regard to floral ornament, there is a rapid descent from the bold character of earlier work to an elegant and finished but comparatively weak type of design; the transition is well indicated in some cuts from background diapers on p. 12. Mr. Westlake observes that in the later period, of which he is now treating, there is in foliage design "much less leading-up and greater simplicity of colour and design, the foliage being frequently simply painted and stained on the white glass"; not the way, certainly, to produce a powerful effect, or such as stained glass is best capable of. In fact, it was with the glass decorative detail as with that of the architecture, prettiness and facility of execution took the place of power and vigour.

The celebrated Fairford Windows come into the history of this period of the subject, and Mr. Westlake refers to the old controversy, much of which was carried on in our columns in 1868, in order to record again, and in a more definite manner, his protest against the Albert Dürer theory. He gives drawings of two of the windows to show their difference of manner and what, in a picture, might be called "touch," among themselves, and on another page the frontispiece from the "Nuremberg Chronicle," by Wohlgemuth, to show the difference between the style of the Fairford Windows and the German style of the early period of the career of Dürer; he also notes again the A on the sword in one of the windows, as a form never known to be used in his monogram by Dürer, who always used the straight-barred A. That the figures are by hands different from those by which most undoubted English windows were executed can hardly be questioned; on the other hand, Mr. Westlake points to the very English character of the canopies as evidence in favour of their English origin. Could they have been English made and designed windows, with figures copied from drawings by a foreign artist? The Albert Dürer theory is, to say the least, not proven, though there is an undoubtedly German look about some of the heads, several of which are separately illustrated to a larger scale (p. 60). It was supported at the time, most strongly, by some critics whose claims to be considered authorities on such a subject have at all events not survived them.

A chapter on Jesse windows forms part of this volume, in the course of which the author makes a suggestion as to the authorship of the notable window of the Margaretting church,—announces "the discovery of a new link. It is probably by John Prudde, of Westminster, and executed about 1460." The reason for this is in the remarkable resemblance of design in certain figures with some of those in the Beauchamp Chapel at Warwick, known to have been executed by Prudde. A comparison between the illustrations given from the two sources will leave little doubt that Mr. Westlake has made a happy hit, and that there is at least a high probability that he is right.

The consideration of the subject windows of the century commences with that of the great east window of York Cathedral, the choir windows of which generally are among the largest and most important windows of this class. The author suggests that the east window may have been put in in memory of Archbishop Scrope, whose "judicial murder" took place in June, 1405, while the contract for the window was given in December of the same year. It was executed by John Thornton, "glasier," who was "to portray the said window with his own hand," and also to provide glass, lead, and workmen who were paid by the Chapter. For this service he had 4s. a week and 5*l.* at the end of the year for three years, with 10*l.* at the end of the third year, though Mr. Westlake doubts if he got this latter sum (apparently a bonus on completing the contract), thinking it probable that it took more than that time to complete the work. A drawing of the greater part of the window is subjoined, but the scale is too small to give anything more than a general idea of it. The head of St. Edward, from the base of the window, given to a large scale, is a very fine example of the work of the period. In regard to the north choir transept window, rather later in date, Mr. Westlake notes, "the colours used in the composition of the subjects are not numerous, nor are they so rich as in the Decorated and Early Perpendicular windows; both the ruby and blue backgrounds are lighter, and the latter very pearly in tone, whilst the yellow glass is of a full golden colour, and the stain is light and lemon-toned; pieces of spoilt ruby, varying from purply to scarlet tones, are admirably combined or contrasted with masses of toned white; it is essentially a whitish window, even the tracing lines and shadows being most delicate. The whole style of the work affords an interesting study, as exhibiting an advance, generally, to a more conventional Perpendicular character than is shown in the east window, whilst it is less advanced than the St. Martin window."

In several of the heads given in various illustrations a very bad effect is produced (worse, of course, in a drawing than in the actual work) by the lead-lines cutting right across the face, a point on which we have not observed that any comment is made. Considering the care which was evidently in general taken to frame a face within the lead-lines, we should imagine these instances were not originally designed so, but were the result of an attempt to make the best of breakages which had occurred either before or after the original leading up of the window. They are not precedents to be imitated, at all events.

Chapters on French, Flemish, and Italian stained glass of the period are added; that on France including among its illustrations two remarkably bold and powerful figure compartments from Le Mans Cathedral, the figures of St. Bartholomew and St. John, with very bold and grand foliage backgrounds; that of St. John is especially fine (plate lxxx). They form a curious contrast to what Winston, as noted above, calls the "timidity" of the English style of the period.

The whole volume, with its profuse illustrations, is of great interest, and invaluable to the student of the subject, as an indication of the direction in which to turn for the best opportunities for study.

Modern Methods of Illustrating Books. This is the title of the new volume of Mr. Elliot Stock's "Book Lover's Library." It is written by Mr. H. Trueman Wood, the Secretary of the Society of Arts, and will be issued very shortly.

PRESERVATION OF WOOD.

BY GEORGE R. TWEEDIE, F.C.S., F.R.M.S.

THE importance of the problem to be discussed in this article has been recognised probably from the earliest ages, though when wood was more abundant and its employment relatively more limited, the immediate pressure of the difficulty was not perhaps felt so greatly as it is in these times. Wood may be briefly described as made up of longitudinal fibrous tubes arranged around the central pith. The function of the tubes, which vary in diameter from 1-2000th to 1-200th of an inch, is to carry the sap in a growing tree from the root to the branches. These ligneous passages contain the chief portion of the vegetable albumen and water, the modification and removal of which are among the objects aimed at by the wood-preserver. The proportion of vegetable albumen varies considerably according to the age and variety of the wood, soft woods containing it most abundantly whilst dense hard ones contain very much less. Dry rot is the result of the attacks of certain fungi, notably *Merulius lachrymans*, *Polyporus hybridus*, *P. destructor*, and *Thelepora puteana*. The first is perhaps the most mischievous and frequently met with, and affects coniferous woods especially, whilst the second is frequently the cause of the deterioration of oak. The development, life history, and action of *Merulius lachrymans* has been recently carefully investigated by Professors Hartig and Poleck independently. Hartig points out that the fungus is* exceedingly sensitive to cold, and hence is never found in living trees, but only in human dwellings. The spores are so minute that about four million only occupy a cubic inch. In large quantities they form a light-brown powder. The germinating filaments are readily formed in nutrient solutions, but do not undergo great development unless in contact with wood, when they branch freely and penetrate readily from cell to cell and vessel to vessel. The perforation of the cell-wall takes place by chemical means; ferments being formed which disintegrate the part of the cell-wall with which they come in contact. Crystals of oxalate of calcium are often formed. Development outside the wood takes place only on moist surfaces.

The destructive action of this fungus depends chiefly upon its power of feeding upon the cellulose, the nitrogenous constituents of the sap, and the mineral constituents of the wood. Poleck found the proportion of mineral matter in the developed fungus to be very considerable, varying from 6·33 to 9·66 per cent., and this has all to be derived from the wood in which it has been resident.

A very important point in connexion with this fungus is that when the mycelial filaments have once been thoroughly deprived of water they have no power of resuscitation.

Wood exposed in warm, damp, ill-ventilated situations is most liable to be attacked by the dry-rot fungi.

Common or wet rot is not radically different from dry rot; both are caused by the total destruction of the longitudinal fibres of the wood by the action of fungi, many of which cause the timber to be more absorbent of moisture than it otherwise would be, and even themselves act as carriers of the water from the surface to the interior.

The liability of wood to rot depends, as is well known, largely upon variety, place of growth, time of felling, age, and mode of employment. A series of experiments, the results of which are given in Young's "Annals of Agriculture," may be quoted suitably here. Inch and a half planks of trees, from thirty to forty-five years' growth, were exposed to the weather for ten years and then examined, with the following results:—Cedar, perfectly sound; larch, heart perfectly sound, but sap decayed; spruce-fir, sound; silver fir, in decay; Scotch fir, much decayed; chestnut, perfectly sound; beech, sound; walnut, in decay; sycamore, much decayed; beech, quite rotten.

* Journal of the Royal Microscopical Society, February, 1886.

It must be borne in mind that in all cases sawn timber is more liable to decay than when it is split, owing to the greater exposure of the cells. Young timber, too, rots far more readily than that of mature age. Certain higher forms of life than those already mentioned are also destructive to wood in certain situations. Thus timber exposed to the action of sea-water is liable to be attacked by the *Teredo navalis*, popularly known as the ship-worm, or wood-worm, which, by means of its powerful auger-like head shell, bores into the timber, making long circular passages, generally in a downward direction. Usually the *teredo*, when quite young, establishes itself in submerged timber some feet below low-water mark, and soon by its own exertions, and those of its very numerous companions, the timber is honeycombed in every direction.

Limnoria terebrans, another enemy of wooden submarine structures, attacks the surface, principally to a depth of about 1 in.; on a surface of wood, 1 ft. square, upwards of 54,000 perforations due to the exertions of this minute crustacean have been observed.

Finally, in special circumstances, the attacks of various insects, such as ants, have to be provided against.

These preliminary remarks will clear the way for an intelligent consideration of the means adopted or proposed for extending the longevity of this important and indispensable building material. The first class of protective processes are those which involve the seasoning or drying of wood.

The general object and effect of timber seasoning is to remove at any rate the greater part of the water, so leaving the putrescible part of the sap in a form less inviting to the attack of fungi and insects, and also to reduce the tendency to warping and splitting owing to the expansion, contraction, or actual loss of contained water due to alterations of temperature and exposure to air.

Exposure in stacks and sheds to the open-air, if sufficient time can be allowed, is probably the safest if the most tedious. From ten to fifteen per cent. of water is still left in well-seasoned timber, and as much as twenty per cent. has been found in fir and pine even after two or three years' stacking. Still this amount is too small to cause the wood to warp, and except in very trying situations it will not, as a rule, develope any tendency to rot, though, of course, unless the wood be protected by the construction of air-passages round it and application of good adherent paint or other surface protection, even though well dried, it may succumb to the attacks of fungous growths or insects.

The natural process of seasoning is most effectual and speedy if the tree has been felled when most free from sap, and if modern users of wood were able to allow sufficient time for the carrying out of this operation, which does infinitely less violence to the internal structure of the wood than any artificial mode of drying, it might be possible to make the material, if properly used, last as long as the oft-quoted Egyptian mummy. In Cresy's "Encyclopædia of Civil Engineering" are the following pertinent remarks which should be carefully considered by modern builders:—"The well-seasoned timber employed by the carpenters of the Middle Ages, in the old halls particularly, as well as in our churches and chapter-houses, needed neither paint nor dressing of any kind to preserve them, and in many instances they are found sound after four or five centuries. The weather-boarding of our English barns, which in many instances is of undressed elm timber, owes its durability to a hard external surface, which it acquires by time and which resists almost the edge of a sharp tool or the point of a nail, apparently a coating of silica quite impervious to moisture; this silica may be derived from the decomposition of the wheat-straw with which these barns are often thatched."

In addition to air-curing, the immersion of wood in water is another old system which was especially favoured for wainscotings, &c. Running water seems to be the most effectual, the soluble matters of the wood being largely removed, and if the subsequent drying of the wood be carefully and slowly carried out, its durability is enormously increased. Even when dry-rot has actually commenced its ravages, prolonged submergence of the timber will sometimes cure it.

Of the artificial modes of drying, there are many, and for the most part they are of more than doubtful utility. They include drying by artificial heat in close or open chambers, charring, steaming, boiling, subjection to currents of hot air, or to the action of various gases, products of combustion, &c.

In Newmann's method, the wood was placed in a large wooden box, steam was admitted, and the condensed vapour, sap, and albumen drawn off: when the condensed liquor was colourless the wood was withdrawn. Super-heated steam has been suggested as likely to give better results.

Davison & Symington's process involved the exposure of the wood to a rapid current of warm air (temperature about 112° F.), and this was said to give good results. In 1837, M. de Mecquenen invented a process in which also the wood was subjected to a current of heated air, which was impelled by a blower entering the chamber at the bottom, and leaving it at the top. An obvious improvement was a reversal of the points of entrance and exit, since, owing to its lightness, heated air tends at once to rise to the top of the chamber and escape, so that it would not be left so long in contact with the wood as would allow it to withdraw the greatest amount of water.

In a process tried many years ago at Woolwich, the best-remembered results of which are the fatal effects of the explosion which followed, the green logs were heated in pulverised charcoal, and subsequently exposed to the products of the destructive distillation of pitch-pine sawdust.

In the American "Journal of Science" for 1820 the use of air-slacked lime is recommended as an hygroscopic agent, the timber being buried in it. In 1874 the drying of timber by exposure in a closed chamber to a current of carbonic acid gas was patented; whilst another patentee suggests that green wood should be cooked in its own juice, by being heated in closed vessels, under pressure, and in such a way that the sap is kept in and the water only removed.

M. Charpentier's apparatus involved the use of an hermetically-sealed chamber, in which the wood was exposed to the action of air heated by passing over metallic plates, and introduced through four longitudinal tubes disposed on the floor of the furnace, from which it was discharged into the drying-chamber.

An attempt to obviate the tendency of artificially desiccated wood to split involved the gradual cooling of the material by use of cold air under pressure.

In 1871, the preservation of wood by drying with the aid of the products of the combustion of refuse wood was patented; the water, it was claimed, being first evaporated, and the tarry and acid products from the wood then absorbed.

With regard to this latter matter, it will be obvious that the greater porosity of artificially-dried wood makes the necessity of superficial protection even more urgent than is the case with the naturally seasoned material; but, on the other hand, this very condition enables absorbent preservative liquids to be far more effectively applied, and indeed desiccation of some sort, of the wood should always precede, if possible, the application of such preparations, as otherwise the contained water will obstruct, and in the case of those of an oily nature, actually repel their entrance into the pores of the wood.

A brief reference may here be made to the nature of the various coatings that have been suggested as useful for the prevention of the attacks of insects, cryptogamic growths, &c., only dealing with those special expedients which have been recommended or patented for the purpose of extending the longevity of wooden structures under exceptional or ordinary circumstances. As regards ordinary paints, washes, tar, &c., their protective character is pretty well understood, as well as their comparative uselessness in trying situations, exposed to rapid alternations of heat and cold, dryness and moisture.

For posts, fences, tubs, and other structures set in the earth, the following composition, which forms an enamel-like impervious coating as hard as stone, has been found to be effective:—Forty parts of chalk are added to fifty parts of resin and four parts linseed oil, melted together in an iron pot; one part of native oxide of copper is then added, and one part of sulphuric acid cautiously stirred in. The mixture is applied hot with a strong brush.

A patented composition for a similar purpose contains galipot, resin, and turpentine mixed with powdered antimony and sulphate of copper.

In 1866 the use of ashpaltum dissolved in linseed or other vegetable oil, and applied cold with turpentine, or hot without, was also the subject of a patent.

A so-called "mineralising" composition for wooden paving blocks was patented in 1868, and contains resin, boiled oil, wood, tar, naphthalene, and plumbago.

A French inventor, about sixteen years ago, took the trouble to patent a composition made up of potter's earth, with fish and ground-nut oil, soot, vegetable or animal black, and hair, but it is not easy to conceive what special advantages the mixture could possess.

Messrs. Douglas & Watson recommended, in 1870, the application first of a resin soap containing alkali, and then, before the first coat dries, a solution of alum. In this way an insoluble film was formed of a kind of basic soap, containing alumina and alkali, but its durability could be but moderate, and its advantages over good white lead paint difficult to appreciate. In another patent an insoluble soap is obtained by employment of sulphate of iron, alumina, or copper; this is then dissolved in a suitable hydrocarbon and brushed over the wood. Resin dissolved in carbon disulphide; resin, copal, and other gums dissolved in hot paraffin wax; a compound made by melting caoutchouc with soot; melted "ozocerite," a mineral wax; pitch dissolved in carbon disulphide, petroleum spirit, or other hydrocarbon; a mixture containing resin, sand, pitch, naphtha, &c.; paraffin and gutta-percha melted together; a mixture of petroleum, resin, galipot, caoutchouc, and vegetable oil; another of naphtha, resin, turpentine, and linseed oil; boiled tar and sawdust; and many others, are compositions which have been patented comparatively recently, very few of which possess any conspicuous merits.

The use of metallic sheets or foil to enclose exposed woodwork; the coating of the surface with galena or sulphide of lead; with Spence's Metal (a compound containing iron and copper sulphides melted with sulphur); with thin sheets of indiarubber, have all at various times been patented.

The casing of the ends of posts, piles, telegraph-poles, &c., which are in contact with earth or water, in earthenware, sheet iron, or zinc sockets, the space between the casing and the wood being generally filled in with pitch or asphalte, has been the subject of several patents. Copper sheathing, though largely used for submarine woodwork, is of little use against the attacks of the *limnoria*, which get between it and the wood, and the destructive work goes on undisturbed.

The use of asphalte applied in the following manner should be efficient for all exposed woodwork; a coating of pitch or tar is first applied, and then the asphalte, using hot irons to smooth and incorporate the surface. This mode of application was patented by Finlay in 1872.

Wrought-iron nails, with heads about 1 in. square, driven into the piles close together, was recommended by Mr. S. Clegg as an effectual preservative of submerged woodwork. The iron corrodes and forms a solid impenetrable rust over the surface of the timber.

Another plan applicable to piles and similar woodwork, which was said to give good results, consisted in the formation around each pile of a wooden casing, leaving about 1 in. clear all round, which was rammed full of

cement concrete. This effectually stops the ravages of teredo, limnoria, &c.

In regard to patented compositions for the protection specially of submarine woodwork, their name is legion and their complexity amazing, the general aim seeming to be the introduction of as many substances as possible that would be likely to disagree with the digestions of the attackers of the structure. A large number contain barium salts as their poisonous basis, incorporated with various oils and varnishes. A mixture of arseniate of copper, oxide of iron, chalk, strychnine, concentrated extract of tobacco, borax, coal tar, linseed oil, or turpentine, was patented in 1868. Another contains oxide of zinc in a solution of india-rubber and aloes.

Tarr & Wonson's patent composition consisted of forty gallons of wood tar and thirty gallons of naphtha; dry ochre was then thoroughly incorporated together with 40 lb. of white arsenic and 160 lb. of oxide of copper. For fresh water coal tar was substituted for wood tar.

A composition containing gas tar, marl, acetate of lead, alum, and sulphate of ammonia is also the subject of a patent.

In 1881 Messrs. Brown & Mitchell patented a compound made up of the refuse from arsenic furnaces (containing zinc, tin, &c.) ground up with ochre and oils and then incorporated with tar and pitch. This was stated to be especially effectual in preventing the growth of weeds and the adhesion of barnacles.

In the same year (1881) Mr. Dennys, of Singapore, brought out a preparation made from the "powder obtained by suspending zinc in a semi-saturated solution of sulphate of copper; the resulting powder after drying and grinding is mixed with the juice of a tree known as *Eloecoccus vernica*, which is sold by the Chinese as vah-ni-shi, or white varnish.

Of other expedients that have at various times been suggested for general woodwork, the following are some of the principal:—The use of sublimated zinc dust or powder as the base of a protective paint; the use of washes containing Portland cement, lime, and sand; a paint containing whiting, baryta, linseed oil, and zinc oxide; the employment of compounds containing *xyloidine*, or the product resulting from the action of a mixture of nitric and sulphuric acids from woody fibre, mixed with various gums and oils.

A curious, but not very practical, patent involved the use of a sulphide of silicon, which was to be applied to the surface of damp wood, decomposition ensuing, with evolution of sulphuretted hydrogen, insoluble hydrate of silica, or silicic acid being deposited on the surface of the wood, and forming a protective film. Tank waste from alkali works, which is rich in the unpleasant sulphides of calcium, has often been recommended for the prevention, and even the cure, of dry rot. The spaces between floor-joists should be filled up with it, and it can also be applied to the ends of beams resting on the walls.

A certain class of preservative paints, which are also fireproof, are nearly all composed of asbestos, mica, borax, soluble phosphates and tungstates, and similar materials, suspended in or mixed with a solution of silicate of potash or soda (soluble glass). In all such compounds, however, adhesion is very imperfect, exposure to weather causing blistering and flaking off: consequently the surface of woodwork so treated requires frequent renewal. Folacci's compound for preserving and rendering wood incombustible contained sulphate of zinc, potash, alum, black oxide of manganese, lime, and common salt mixed with water, and a little sulphuric acid. Another patentee recommends the application first of silicate of potash and then of lime; in this way a fairly adherent coating of silicate of lime is formed.

Mixtures of the silicates of lime and magnesia; of asbestos, chalk, and soluble silicates; of powdered glass, ground porcelain, powdered stone, lime, and silicate of soda; of gelatinous hydrate of alumina, with an alkaline silicate, have all been patented as useful for fireproofing and preserving wood.*

* To be concluded in our next.

NOTES.

THE new Government have already announced their intention of including a Railway Bill in their legislative programme. The materials for a good measure, and one satisfactory to all parties, are available, as Mr. Stanhope went thoroughly into the question as President of the Board of Trade under the last Conservative Administration; and, while the proposed Bill will be on the lines of the one prepared by that gentleman when in office, some of the features of Mr. Mundella's Bill will doubtless be also adopted. The latter measure has been so recently and so fully discussed, that its good and bad points will be fresh in the minds of members,—though several of its most prominent supporters and opponents are not in the newly-constituted House. In the face of the still decreasing dividends declared by the railway companies, it is certain that nothing manifestly unfair to them would, if proposed, receive support, but there is no doubt that a measure adjusting some of the anomalies and difficulties which have so long called for legislation would speedily pass into law.

IT is not surprising that in these days of canal-cutting enterprise, the old idea should have been revived of cutting a canal from the sea to the Birkenhead Docks, across the low flat country lying between the outfalls of the Dee and the Mersey, and thus getting a passage which will enable ships to avoid the bar of the Mersey. Mr. H. E. Baggallay, C.E., has prepared a plan of the scheme, which we imagine to be a perfectly feasible one, and which was, in fact, brought prominently forward half a century ago, when Birkenhead, as a town, may be said to have been founded. Great things were expected from it for the new port on the left bank of the Mersey; it was prophesied that before many years Liverpool would be referred to as a town "near Birkenhead"; and the lines of new streets were laid out on the Birkenhead side in preparation for a town on a grand scale; the curb-stones for the projected streets, which never came into existence, being long after visible, radiating in straight lines through fields and common land. These outlying portions of the present town have now assumed a suburban character, and are, in fact, practically suburbs to Liverpool rather than to Birkenhead: but there is no saying what revivifying effect the proposed canal might still work if carried out. The ground seems almost made for the purpose of such an experiment.

SIR DANIEL GOOCH'S explanation, at the 102nd half-yearly meeting of the Great Western Railway Company, as to the non-opening of the Severn Tunnel, cannot be regarded as wholly satisfactory. It is now a considerable time since we were told that "the first passenger train passed through the tunnel, which may now be regarded as an accomplished fact." "The whole of the tunnel under the river," it was then stated, "is as dry as possible; but on the Monmouth side, where a spring was met with, there is a slight leakage, which will be stopped in a few days by caulking and cement work." In the Report for June 30th, 1885, the directors anticipated the establishment of traffic through the tunnel in the spring of the present year. Now, however, it seems that this has not been attempted, "as Sir John Hawkshaw considered that the final completion of the works might be thereby retarded." In addition to this, we are now further told of the construction of a "new permanent pumping-shaft at Sudbrook": of the erection of "two of the permanent pumps," and of the completion of "permanent engines and pumps at 6 miles 36 chains." All this pumping from a work described to be "as dry as possible," is not what the shareholders were led to anticipate; and it will take something more in the way of statistical information than the Chairman has yet vouchsafed to show that the construction of a costly tunnel of 7,664 yards long, of which the brickwork is in some parts 3 ft. thick, and which needs so much permanent pumping, in order to shorten the distance between Cardiff and London by thirteen miles, is a very well-considered expenditure of capital. Nor is it clear what the hope expressed by the Chairman as to obtaining "enhanced traffic from the North and West of England" can have to do with this dip under the Severn.

IN regard to the competition for new Municipal Buildings for Edinburgh, as the Corporation have adopted the now too-prevalent custom of requiring architects to make a deposit of money (3*l.* 3s. in this case) before they can ascertain in detail what the requirements of the competition will be, we give some particulars which have been promulgated in the *Scotsman*, which may serve as a guide to some young aspirants as to whether it is worth while to risk their guineas or not:—

"The conditions of competition specify that each design must be illustrated by geometrical drawings of the plan of each floor and of the roofs; the elevation of each external façade, the sections, one longitudinal and one transverse, showing the façades of the internal court or courts; a block plan, showing the proposed buildings with reference to the adjacent streets and houses, and detail drawings of the principal features of the design. Further, each competitor is to submit a probable estimate of the cost of the entire structure according to his design, and it is stated that 'the element of cost must form an important consideration in judging of the merits of the design.' It is laid down that the main staircases, corridors, and internal spaces must be of ample, though not excessive, dimensions, and the courts, rooms, staircases, and corridors must have lofty ceilings, and be well lighted and ventilated. All external façades and those to the courts are to be of stone, the floors of fireproof construction, the roofs to have their constructive portions in iron, while the stairs are to be of stone. Ample lavatory accommodation, thoroughly ventilated, and on the most approved sanitary principles, has to be provided; as also a pair of passenger elevators, and a hoist for lifting coals from the level of Cockburn-street up to the highest floor. All canvassing of the Magistrates and Council, or of their assessors, in favour of any particular design, is not to be admissible. After the prize award has been made public, the Magistrates and Council take power publicly to exhibit all the designs."

We hope the plans and particulars will be got out in such a manner as to justify the deposit. In some similar cases they certainly have not been.

THE new form of Charter of the Institute of Architects is in the hands of members, and we will give some special consideration to it in detail in our next.

THERE is no department in the local government of our towns and cities which shows such variations and irregularities as that of scavenging; and any light that can be thrown on the subject from present or past experience should be of considerable value. This is well exemplified in the case of two populous seaports in South Wales, viz., Cardiff and Swansea, both rapidly increasing towns under very much the same industrial conditions, and, to a certain extent, rivals of each other. Yet between these two places there is a most remarkable difference in the cost of keeping them clean. Cardiff has not only the largest population, but one which increases at quite an alarming rate, the inhabitants of 1881 numbering 85,378, while now they are estimated at 97,034. The following short table shows that while the population grows at an unusual pace, the expenses of scavenging have grown still quicker:—

Year.	Occupied Houses.	Cost of Scavenging.	Cost per House.	Cost per Head.
			s. d.	s. d.
1875	7,700	£3,127	8 11	—
1878	After the extension of the borough	5,103	—	—
1881	12,113	6,607	10 10	1 6½
1883	—	8,420	—	—
1885	16,938	11,494	13 7	2 5

Since 1881 the population has increased 13 per cent., the number of inhabited houses by 33 per cent., and the cost of keeping the town clean by 60 per cent., while the wages paid in 1875 to the men employed in the scavenging amounted to 767*l.*, rising, in 1878, to 1,519*l.*; in 1881 to 3,892*l.*; and in 1885 to 6,528*l.* During the past ten years the rateable value of Cardiff has increased 150 per cent., the

salaries of corporate officers 210 per cent., and the cost of scavenging 370 per cent. It need scarcely be said that the Cardiff scavenging is not done by contract, as it used to be done ten or eleven years ago, but by a Health Committee. Swansea, which has forty-six miles of streets and over 12,000 houses, does its scavenging by contract, the contract amounting to 4,622*l.*, or at the rate of 7s. 8d. per house. As the streets of Swansea are kept quite as clean as those of Cardiff, it is scarcely to be wondered at that the ratepayers of the latter town should be inquiring why they have to pay nearly double the price.

NO visitor to New York could fail to be struck with the dense and complicated network of telegraph-wires, which, until very recently, stretched along the Broadway and principal thoroughfares, a network that was as disfiguring as it was dangerous. This nuisance, however, has just been removed, not only from that city, but from Chicago, Washington, St. Louis, and other big towns, by a legislative decree providing for the compulsory abolition of overhead wires. In future, not only the telegraph, but also the telephone and electric light wires, are to be conducted underground, either in conduits or tunnels beneath the pavement, and by this means a very remarkable improvement will be effected in the matter of street architecture, while some very tangible dangers are removed from the passers-by. Even in this country, where we are not accustomed to such violent alternations of wind-force as take place in America, deaths have occasionally happened from falls of the wires during heavy snowstorms, while even in the country, where such contingencies are not likely to occur, considerable loss of property frequently is occasioned by the blowing down of posts during a gale. All these mishaps would be rendered impossible by an underground communication.

THE curious battlements crowning the Cá d'Oro at Venice, and the absence of a cornice, have been frequently remarked upon, and it has been suggested that the present termination of the building is not original. Signor Boni, to whom we are indebted for several interesting discoveries in his native city, has ascertained that the battlements undoubtedly formed part of the original design, and has recovered the design of the cornice which formerly extended the width of the building next the Grand Canal. The front cornice has disappeared with the exception of some of the brackets supporting the arcades, but the position of the arcading is clearly indicated, and a portion of the cornice still exists on the return next the narrow street or *calle* adjoining the palace to the eastward, from which it has been easy to reconstitute the design of the entire cornice. The original agreement for the building of the Cá d'Oro has been recently discovered by Signor Bartolomeo Cecchetti, the Superintendent of the State Archives, among the papers of the Procurators of St. Mark. The architect was John Bon (the designer of the famous Porta di Carta and an ancestor of Signor Boni), and it appears that the work was carried out by the proprietor Count Contarini himself, who stipulated that certain old materials should be utilised in the buiiding. This explains the presence of some antique marbles and fragments of Byzantine sculpture in the front of the palace, which have exercised the ingenuity of some archæologists who have endeavoured to assign a greater antiquity to the building than its general design suggests. The date of the Cá d'Oro is clearly fixed, by the documents recently discovered, as belonging to the early years of the fifteenth century. In the building agreement the architect, John Bon, with his son, Bartholomew and his two assistants, Zane and Rosso, undertake to work for one year, from the 4th of August, 1424, for the sum of 140 gold ducats, or about 70*l.* English money. The Cá d'Oro was richly gilded and coloured externally, traces of this decoration being still visible in places, and there seems to be very little doubt that it owes its popular name to this fact, notwithstanding various ingenious suggestions to the contrary, which seek to derive the name from the family of Doro.

A MOVEMENT is on foot for the restoration of one of the oldest and most interesting churches in the Principality, viz., that of Llantwit Major, near Cowbridge, in Glamorganshire, a village which is almost unique for its ancient associations and existing remains. Llantwit was not only a monastery, but a very famous university or school of divinity, founded by St. Iltyd in the fifth century, and said to have included among its *alumni*, Gildas, the historian, St. David, and even Taliesin, the oldest of the Welsh bards ; while the number of less eminent students was so great as to have necessitated 400 houses and seven lecture-halls. The church is of different dates : what is called the new church, which is of the thirteenth century, being, curiously enough, older than the other part, which is a couple of hundred years later. At the west end of the latter are the ruins of a Lady Chapel, 40 ft. in length ; but the chief interest lies in its tombs, one of which has a row of lozenge-shaped compartments, with an arabesque ornament on one side, and a series of interlaced rings on the other. In the churchyard is an upright stone, believed to be Runic, and the shaft of a cross to the memory of St. Iltutus, or Iltyd. The antiquities of this quaint village are not confined to the church, for close by is a very singular little Town Hall of Norman date, with a flight of steps by the side and an inscribed bell in the gable, while for some distance around there are traces of ruined buildings, probably those of the University. Upwards of 700*l.* has been already subscribed towards the restoration, and, considering the historic celebrity of the village, there is no doubt that sufficient money will be found for the purpose.

THE Bath Town Council have had a little difference about the payment to their architect, Mr. Davis, of the commission payable on acceptance of tenders for the new baths. One of the Council did not think an architect should be paid "in this way," and instanced a case where the same gentleman had been asked to make sketches for a new bridge, and "did not bring in his bill for a considerable time." There is in the world, we believe, a general feeling in favour of people who "do not send in their bills for a considerable time" : the Bath Town Council are not singular in that respect. Another member proceeded to explain that "the Society of British Architects," by which we presume he meant "the Institute of British Architects," had laid down rules for the guidance of architects in regard to the method of charging their commissions, and proceeded to specify these. Thereupon arose a protest on the part of the Mayor and others present that such "rules" were not binding on them. Who ever said they were ? That is a misconception which is constantly cropping up. The Institute never laid down any "rules" for architects' charges ; they specified certain charges as fair and right, thereby giving the architect who made such charges the weight of their representative opinion to back him. But the Institute make no pretence that such charges are binding on any one, as Judges and Lawyers and Town Councillors are always pretending they do. This sort of insinuation is constantly being made, and there is no ground whatever for it. Eventually the Council concluded (and correctly) that it is not usual to pay an architect more than half his commission when the tenders are accepted and before any work has been commenced, and dealt accordingly.

IT appears from a recent letter in the *Times*, that the artistic correspondent of that journal, who can see no difference between ancient and new mosaics, has gained the suffrages and sympathies of that particular surveyor who, at a meeting of the Institute of Architects for considering the decorative treatment of domes, distinguished himself by the suggestion that St. Paul's dome would be best treated by a coat of whitewash. *Arcades ambo !* It would be interesting to know on whom it devolves, in the *Times* office, to decide upon the fitness of correspondents to instruct its readers in art and architecture, and how the decision is arrived at.

NOTES IN KENT,

WITH THE ARCHITECTURAL ASSOCIATION EXCURSION.*

ON Wednesday (the 11th) the first place on the programme was Penshurst, the way to which lay through Hadlow, where there is a lofty prospect-tower, perhaps 200 ft. high, built earlier in the century by the then owner of the house, and coated from top to bottom in cement. It might serve as a good advertisement for the cement-makers, since there is not a flaw visible, but as an architectural feature it can only excite wonder and derision. Penshurst is too full of interest to be properly treated in notes such as these. It is a large and straggling collection of buildings of varying dates, picturesque and stately from every point of view, surrounded wth splendid old gardens, which stretch away with steps and terraces, cut yew hedges, long alleys, and straight grass walks, till they meet the ancient trees of the park. Beyond one part of the enclosing wall lies the church, which from the village is approached under a picturesque half-timber cottage. The house itself, however, claims chief attention. The hall, dating from about 1341, is one of the largest and loftiest in any private house, and speaks of the great opulence and power which the builder must have possessed. It was built by Sir John de Pulteney, who purchased the manor from the De Penchesters, who are the earliest recorded possessors. Sir John's son alienated the estates to one Guy Lovain, whose son, Sir Nicholas, left a widow. She for her third husband married Sir John Devereux, who added a large wing towards the close of the fourteenth century, having obtained a licence to build and embattle here in 1392. After his death the estates passed through many hands, till they came to their most illustrious possessors, the Sidneys. Edward VI. in 1552 granted Penshurst to his tutor, Sir William Sidney, who had distinguished himself at Flodden Field. Sir William did not long enjoy the estates, as he died in the following year, and was succeeded by his son Sir Henry, to whom we owe nearly all the later buildings. These are all of brick, while the older buildings are of stone, and the two materials, under the kindly hand of time, combine to form the most beautiful masses of colour. The buildings of the Sidneys may be recognised not only by their material, but by the heraldic arms and cognisances with which that family adorned all that they built. Penshurst has always been a lovely place. Even when the brick buildings were new the air of antiquity remained, and Ben Jonson sang their praises, along with those of the orchard and the garden, and, above all, of the noble Sidney who lived there :—

> "Now, Penshurst, they that will proportion thee
> With other edifices, when they see
> Those proud ambitious heaps, and nothing else,
> May say, their lords have built, but thy lord dwells."

Sir Henry married Lady Mary Dudley, sister of Queen Elizabeth's favourite, the Earl of Leicester, and the alliance is recorded in the buildings by the use of the bear and ragged staff as an ornamentation on the screen in the hall. Sir Henry's eldest son was the celebrated Sir Philip Sidney, who succeeded to the estates only a few months before his early death. The architectural history of the place may be said to close with Sir Henry's death, for after that no building of importance seems to have been done till quite modern times.

Hever was to have been visited next, but the occupier objected, and therefore Somerhill, the seat of Sir Julian Goldsmid, just outside Tunbridge, was substituted. Somerhill is interesting chiefly as being one of John Thorpe's works. A plan of it, entitled, "Lo. Clanrickard," is in his book at the Soane Museum. It was built by Richard Burgh, Lord Clanrickard, and some of the spouts bear the initials R. C. and the dates 1611 and 1613. There is not much detail left, but the general appearance is stately, the old stable-yard is picturesque, and the new stable buildings, designed by Mr. T. H. Watson, are particularly happy, and add very much to the whole effect. Tunbridge Castle was visited on the way back to Malling, but of this it may be said, as of Allington and Leybourne, that it is

* See page 226, *ante*.

food for the archæologist rather than for the architect.

Thursday morning saw the excursion on the way to Boughton Monchelsea. Boughton was a fine place once. North of the house lay the kitchen garden, within a fair stone wall. Opposite the front was a broad green sward, with geometrical flower-beds and prim plantations on either side, and a tiled path running down the middle to a bowling-green, bounded on the further side by a trimmed hedge, under which a path led to another collection of parterres, a little way down the hill. Southwards from the front of the house, a broad green walk led to a detached summer-house, such as still exists at Severn End in Worcestershire. The house was bounded on the south by a court, beyond which lay a green-court, and on the west by the wood-yard. Most of this is altered now. The bowling-green has disappeared, and so has the summer-house; across the space where the bright parterres used to be, the carriage-drive now sweeps, and the prim plantations have turned into a fine irregular mass of trees. But the wide view is the same, and if ever the builder of the house went to the brow of the hill to enjoy the prospect, which is much to be doubted, for the admiration of scenery as scenery is a growth of the last century and a half; but if ever he did linger on the prospect, it must, in its main features, have been such as may be seen to-day. The disposition of the nearer fields, no doubt, was different; but where the eye ceases to take in details it would hardly find much change. The same green hop-fields, stretched away to the distant hills, varied by the smoother meadows and rougher woodland. Red roofs peeped out amid the trees, and the same towers and spires rose from the encircling trees, just as they do to-day.

The house itself has changed with the changing times, and though the exterior retains much of its original appearance, the interior has been completely altered by different owners, and now is chiefly modern. There is a good Queen Anne staircase, and there are one or two scraps of sixteenth-century glass, some of which bear the date 1567, with the arms of the then possessor, Robert Rudston.

It would serve little purpose to give the history of the manor previous to the building of the house. The possessor at that time was Robert Rudston, son of Jas. Rudston, who was Lord Mayor of London in 1528. Robert Rudston did most of the building in the years 1565 and 1576, and his son Belknap Rudston settled the estate on his kinsman, Sir Francis Barnham, from whom, by marriage, it has descended to the present owner, Mr. Rider. The church has been almost entirely rebuilt, but there is a good old lych-gate left.

East Sutton has one of the most interesting churches visited on the excursion, and it has the rare merit of being unrestored. The north chapel, of Decorated work, is the best part of the structure, and its two elaborate windows, one of which is beautifully treated on the inside as well, found their way into many sketch-books. The manor of East Sutton came into possession of the Filmer family by purchase early in the reign of James I., and as it has been in their possession ever since, the church contains many of their monuments, as well as some to the Argall family, their predecessors. One or two of them are particularly good.

In the chancel is a large brass of unusually late date, to Sir Edward Filmer (who died in 1629), his wife, and eighteen children, the whole family being duly depicted on it. This Sir Edward was the purchaser of the manor. He had previously resided at the adjacent house of Little Charlton, said to have been built by his father, Sir Robert Filmer, in Elizabeth's reign, but the date on the house of Little Charlton is 1612. Whether it is the original date, or a copy, or an invention, it is not easy to determine, for the house has been restored and enlarged. However this may be, Little Charlton was the first home of the Filmers in this parish, but when Sir Edward bought East Sutton from Sir John Argall, whose sister he had married, he left Charlton and took up his residence at the manor-house by the church. Both the houses still remain. That by the church has been enlarged and altered till little of the original work remains. Little Charlton has also been enlarged, but one wing of the old house remains and is figured in Nash's mansions, and there are several features still remaining inside.

Leeds village was the next place visited. Some of its houses are very quaint and picturesque, and date from the fifteenth century, vieing in age with much of the castle itself. The church is a fine one, as churches in this district go, and the earliest parts of it date back as far as the Norman period, showing that there must have been a community here long before the earliest existing parts of the castle were built, unless we except the foundations, which are attributed to Odo, Bishop of Bayeux, and half-brother to William the Conqueror. The greatest historical interest of this neighbourhood attaches, of course, to Leeds Castle itself, and it is a curious sight to see an ancient fortress on tiny islands, with walls rising sheer from the waters of the lakelet, inhabited as a modern residence, with all the signs of a well-kept and frequented place about it. It is true that the most distinctly Mediæval part has a ruinous air; the grim gateway has been converted into a porter's lodge, but the remains of the machicolations have been left and serve to point the comfortable moral that the world has grown more peaceful since they were devised for the purpose of casting unpleasant objects on unwelcome visitors. The castle must in its day have been a place of strength. It

stood on three islands, of which two are now left. On the first was the barbican and flour-mill; on the second, the gateway, the court-yard, and part of the castle; and on the third, far removed from the land, and only accessible across the other two, stood the bulk of the castle itself. The barbican and mill are now indistinguishable ruins, and the waterway that divided them from the land has been filled up. The gatehouse, too, has a ruined air about it, but still serves as a gatehouse and porter's lodge. The court-yard is a broad mass of turf shadowed by trees, and intersected by the carriage-drive. That part of the castle which stood on the second island was rebuilt sixty years ago. It is the third island that retains the chief part of the old work. This, however, has lost its purely Mediæval character, since it was rebuilt in Henry VIII.'s time, and its appearance is rather that of a manor-house than a fortress. The portion that was rebuilt sixty years ago was the work of the possessor in Elizabeth's reign; the structure that now takes its place was made to harmonise with the earlier work of Henry VIII.'s time, and the general effect is decidedly good and stately, though the detail is devoid of interest.

The history of the castle is full of stirring incident, for it was in the possession of the Crown, and dominated the whole of this part of Kent. William of Wykeham was at one time Chief Warden and Surveyor of the King's Castle of Leeds, but there is no work left which can be ascribed to him. In 1512, Sir Henry Guldeford was appointed by Henry VIII. Constable of Leeds and Keeper of the Park, and he thoroughly restored the castle at the king's charges. It is chiefly his work which gives the castle its present character. So far back as the year 1320, at an earlier time than most of the existing work, and when, possibly, the castle was not so elaborately defended, it was under the governorship of "the rich Lord Badlesmere," but he, "being puffed up through ambition and his great wealth," forgot his allegiance, and joined with the Earl of Lancaster and other barons who were discontented with Edward II. The castle was under the care of the Castellan, Thomas Coleper, when the queen endeavoured to gain it by a ruse, feigning a pilgrimage to Canterbury, and sending to the castle to demand lodging for herself and retinue. The stout Castellan refused to admit any one without letters from his lord, and the vexed queen retired discomfited. The king, enraged at the indignity offered to her, laid siege to the castle through the Earls of Pembroke and Richmond, and, the discontented lords not coming to the rescue, the castle finally capitulated. The brave Castellan was hanged, Lady Badlesmere and her children were sent to the Tower of London, and the rich lord himself was pursued and finally taken prisoner, and thereafter hanged and drawn at Canterbury, where his head grimly garnished one of the gates.

Some three quarters of a mile to the south of the castle used to stand the Priory, or Abbey, as it was more recently called. It was granted at the Dissolution to Sir Anthony St. Leger, and after passing through various hands came into those of William Covert, a scion of the great family of Covert, seated at Slaugham Place, in Sussex. He put a new front to the house that had been made out of the old buildings, about the year 1598, and, judging from a plate in Harris's history, it must have been a fine piece of work; but the remains of the abbey now are but scant, and offer no subjects for the architectural pencil.

It is not far from the castle to Hollingbourne, where lie buried many of the Colepepers. The church itself is not of much interest, but some of the monuments are, and the mortuary chapel on the north side is, perhaps, unique in treatment. It dates from the beginning of the seventeenth century. The walls have a wood panelled dado, above which they are cased with black marble in squares, every alternate square having a raised shield, the plain squares receiving the inscription. Only a few inscriptions have been cut, however, and the chapel is an example of the vanity of human wishes, provision being made for perhaps 100 burials, and only half a score taking place. The effect of the black marble is *triste*, and detracts from the beauty of the design, which is very suggestive. There is a handsome altarcloth, worked by two daughters of Lord Colepepper while he was in exile with Charles II. In the village is a good-sized Elizabethan house, once a fine place, but now suffering from many alterations, one of which has at some time removed one entire wing.

Wrotham Place, visited on the last day, is an Elizabethan house considerably altered, but containing many beautiful *articles de vertu*, which were very kindly exhibited the visitors by their host. The church does not contain much of interest. Of far greater interest is Ightham Church, which contains several fine Jacobean monuments to the Selbys of the Mote, and an exquisitely-accoutred figure of Sir Thomas Cawne, also of the Mote, who died *temp.* Edward III., and left by his will 20*l.* for the making of a window above his tomb, which accordingly was done, and remains to this day. The village of Ightham contains some picturesque cottages, but the great attraction is the Mote, which lies about two miles away, down in a valley surrounded by woods. The history of the place is not thoroughly known, and the history of an old building is always important, as showing by whom it was built, and often accounting for features and ornaments which would otherwise be difficult to explain. The presence of the above-mentioned Sir Thomas Cawne is not easily accounted for, since the De Hauts seem to have been in possession from before 1370 till Henry VIII.'s time, after which the estates belonged to a Sir Richard Clement. From this family they passed through some Allens to the Selbys, whose arms appear in several places. Thus much can be ascertained; but the builders of the various parts

cannot be identified. The oldest part seems to be the hall, which is a lofty apartment of the Decorated period. The roof is of wood with moulded principals, a curious feature being the use of a finely-moulded stone arch about one-third down the length of the hall. The exact reason for the use of stone instead of wood is difficult to fathom. In the time of Henry VIII. there was a large new fireplace built in the hall, as well as a new window, and a private chapel was built at the opposite corner of the courtyard, thus superseding the older one near the hall, of which the crypt still remains. The new chapel is of great interest, since much of the original woodwork remains. In a room leading off the stairs to the chapel is a very handsome Jacobean chimney-piece. Outside, whether in the courtyard or looking on to the moat which completely and closely surrounds the house, everything is picturesque. There is stonework, with stone mullioned windows; and half-timber work, with wood oriel windows and delicately-carved barge-boards; there are red brick chimneys, with beautiful smoky tops, and moss-grown tiled roofs and green climbing plants; there is work for the pencil, the pen, and the brush; for the architect, the artist, and the amateur: and they all know it. Few houses have been so often sketched as Ightham Mote, and few are worthier of such an honour; while if there be any to whom sketching is an unknown pastime, it is a pleasure merely to wander round the passages and to bask in the sunshine before the great gateway while gazing down into the waters of the moat, and watching the fish as they placidly pilot themselves through the weeds.

THE CHESTER MEETING OF THE ROYAL ARCHÆOLOGICAL INSTITUTE.

Following the proceedings of the opening meeting, which were reported in our last,* there was a perambulation of the city walls, under the guidance of Mr. W. Thompson Watkin (author of "Roman Cheshire") and Mr. G. W. Shrubsole, F.G.S. Ascending the steps at the Eastgate, the visitors proceeded northwards, Mr. Watkin observing at the outset that the existing walls are undoubtedly more or less on the line of the Roman walls, though they were, in his opinion, decidedly much later than the period of the Roman occupation,—of the Edwardian period, in fact. Some projecting stones at the foot of the outer face of the wall near the Kaleyards Gate, which some local antiquaries used to regard as Roman, had been proved, by excavation, to be of the Edwardian period. When this portion of the wall was reached, the visitors descended for a few moments for its examination, Sir James Picton remarking that it exhibited no signs of Roman work; the characteristic wide mortar joints of Roman work were wholly absent. The wall seemed to have shown a tendency to lean outwards at this point,—the upper part still overhangs to a perceptible degree,—and the projecting stones at the foot of the wall were probably merely put there to prevent the wall slipping further. The Rev. Prebendary Scarth, well known for his acquaintance with Roman remains, said it was very clear that the masonry of this part of the wall was not of the Roman period. Mr. Watkin added that since the walls were built they had been constantly repaired, and there were records of the proceedings of the "murengers" or wall-guardians. Pointing to the perishable and perishing red sandstone of which the masonry of the walls is composed, Mr. Watkin remarked that it was scarcely likely that the Romans, who always built so solidly and chose good materials, would use so soft and friable a stone as the red sandstone now to be seen in the walls; but, even if they had used the red sandstone, what likelihood was there that it would, after the lapse of 1400 years, have remained to the present day, seeing that the stone work of the cathedral, some of it only erected 400 years ago, was thoroughly worn away and decayed prior to the restoration of the cathedral? Mr. Shrubsole remarked that, at the suggestion of the late Dean Howson, an excavation was made along the front part of the wall at this point. The excavation was carried to a depth of 10 ft. or 12 ft., but not a fragment of Roman work of any kind was found. The excavation, however, led to the discovery of a plinth, described by competent architects who had seen it as of the Edwardian period. The stones of that plinth were without mortar, and certainly without Roman mortar joints, such as were seen in other and undoubted Roman work found in Chester. The projecting row of stones was not bonded into the wall behind, but formed a mere outer skin, with no concrete or grouting in any part of it. The conclusion to be drawn was, as had been suggested by another member of the party, that these projecting stones were merely deposited at the foot of the wall in order, by their weight and bulk, to prevent the wall slipping down or toppling over. The late Dean Howson had come to the conclusion that there was no trace of Roman work in that part of the wall. Professor C. T. Newton said that if that part of the wall were Roman, those who were engaged in the excavation ought to have found some fragments of Samian ware at its foot. Mr. Shrubsole said none were found, whereupon Prof. Newton said that seemed to be conclusive evidence that the wall was not Roman, for the Romans were in the habit of throwing all their broken pottery and rubbish over the town walls. Mr. Watkin, in answer to a question, said that possibly some of the stones to be found in the existing wall were Roman, but they were not in the positions in which they were left by the Romans. Passing northwards along the wall, the visitors came to what is now called the Phœnix Tower, at the north-east angle of the walls; on the top of this tower King Charles I. is stated to have stood and witnessed the defeat of his army on Rowton Moor. Turning along the northern side of the wall, the visitors proceeded westward, crossing the North-gate and passing the low tower called "Morgan's Mount," and the next one, called "Pemberton's Parlour," which bears an inscribed tablet recordiug the names of the "murengers" or wall-guardians, and some of the work which they did. The inscription is dated 1701. It was stated that there is no longer a body of murengers, but we believe that the Corporation undertakes the work of keeping-up and maintaining the walls, of which the city may well be proud, for although there appear to be good grounds for abandoning the local tradition that the walls as now existing are Roman, Chester will remain unique as the largest city in the United Kingdom completely surrounded by walls dating from Mediæval times. The question being asked whether there was a fosse outside the wall, a reply was given in the affirmative, and it was stated that for the canal which now skirts the north wall, the line of the fosse was partly utilised, the fact being that the contractor for the construction of the canal was agreeably surprised and pecuniarily benefitted by the discovery that a great deal of the cutting through the rock which he had anticipated and estimated for had been done centuries ago. Near the two towers last named, and before the present north-western corner of the walls and the picturesque Water Tower were reached, Mr. Watkin pointed out what he believed to be the point where the western wall of the Roman castrum had originally terminated, for in a field now enclosed within the walls Roman interments had been found, and, as was well known, Roman interments were always extra-mural. The Rev. Precentor Venables, remarking on this, said that the same thing had occurred at Lincoln, where, as the population of the city extended, the wall was carried further down the slope, in a manner almost identical with what had evidently been done at Chester, and parallel with the first wall. Arrived at the Water Tower, the visitors descended into an enclosure to examine a Roman hypocaust found beneath an old building in Bridge-street. The pillars are stated to be arranged on the same plan and at the same distances apart as they were when discovered. They were when found covered with large tiles (some of which are preserved), which carried a thick coating of concrete. The pillars, or *pylæ*, of the hypocaust, it should be observed, are of stone, and not of tiles superposed to give the requisite height. They are monolithic, but diminished in the centre so as to allow as much space as possible for the passage of the hot air. In answer to Professor Newton, Mr. Shrubsole said that the tesselæ were laid upon concrete, fine at the top and coarser underneath. Professor Newton said that was according to the Vitruvian formula. Ascending to the wall again, the visitors proceeded southwards, having the large open space used as a race-course on their right hand, between the city wall and the river Dee. The low-lying nature of the ground here was pointed out, and it was stated that at one time the whole of this low ground was under water, which came up close to the foot of the west wall, as it does now on the south and south-east. In corroboration of this statement it was pointed out that, not long ago, in digging some foundations for the new gasworks, a pig of lead was found 23 ft. below the level of the surface, and bearing an inscription of the time of Vespasian; it was dug up under such conditions as to leave no doubt that it must have fallen overboard or been thrown into the water from a vessel passing over the site. Additional evidence of the nearer approach of the waters to the walls at one time was shown by the position of the Watergate, at the foot of Watergate-street,* and by other traces, such as the appellation of "The Yacht" to an old inn just within the walls, of the close contiguity of the water at one time. At a point of the wall a little further south another lot of projecting stones were seen at the foot of the outer face of the wall towards the Roodee. Here a discussion ensued similar to that which arose over the projecting stones found near the Kaleyards Gate, the conclusion arrived at being the same, viz., that this masonry was not Roman, but that the stones had been deposited where they are now seen as a rough-and-ready engineering expedient to prevent the fall of the wall proper. Going southwards, towards Grosvenor-street, the party was about to continue the perambulation of the walls southward, past the Castle and prison, over the Bridge Gate, and then eastward *viâ* the "Wishing Steps" to the East Gate, when a smart shower brought this plan to a premature close, and the visitors hurriedly took refuge in the admirable Grosvenor Museum, of which we are able to give a view and plans this week. Here Mr. Shrubsole, Mr. Watkin, and Professor McKenny Hughes explained some of the most interesting exhibits of an archæological character. Mr. Shrubsole, who is the Hon. Curator of the Museum, has, we may here mention, published an excellent illustrated catalogue† of the Roman altars and inscribed stones in the Grosvenor Museum, so that it is unnecessary for us to dwell at length on this part of the afternoon's proceedings. Meanwhile, another party perambulated the walls southwards from the Eastgate, and the intention was that when the two parties met they were to change guides; but, as in most other arrangements of the kind, so far as our experience goes, the result in practice was not a success, however well it may have looked upon paper. Possibly the rain was to blame for this. Another party traversed some of the old streets of the city, examining the most picturesque of the houses and the "Rows." One or two very good crypts were seen, notably one in Watergate-street, now in the occupation of Messrs. Quellyn Roberts & Co., wine merchants. This crypt is very large and in excellent preservation, and its present owners and occupiers are justifiably proud of it. Occasion was taken by one of the leaders of the party to point out that these crypts were very common in Mediæval times under houses of large size; they were used for storage purposes, and the common notion that they were necessarily of ecclesiastical origin was a mistaken one.

When the rain had abated the visitors proceeded to the Church of St. Mary-on-the-Hill, or St. Mary-super-Montem, anciently called St. Mary de Castro. Here the Rev. H. Grantham, the rector, received the visitors, and described the church, about which we will say more next week.

In the evening, Mr. E. A. Freeman delivered his address as President of the Historical Section, as mentioned in our last, and on the motion of the Rev. Precentor Venables, seconded by Mr. Peacock, F.S.A., a vote of thanks was given to Dr. Freeman for his address.

On Wednesday, as before mentioned, Valle Crucis Abbey, Wrexham, and Chirk Castle were visited, but of this excursion and of other proceedings of the day we must defer a more detailed account until next week.

In the evening the Antiquarian Section was

* See *Builder*, p. 249, *ante*.

* The Water Gate is situate about midway in the face of the west wall, and some little distance from the water now. It must not be confounded with the Water Tower, which is at the north-west angle of the walls.

† Chester: Phillipson & Golder, Eastgate-row.

opened by the address of the President of the Section, the Bishop of Chester, who in the course of an earnest and able plea for the preservation of old records, especially manorial court-rolls, said,—No one who has not, as I have done in past years, spent days and weeks over this sort of muniment can at all realise the immense amount of local, historical, and genealogical material which lies hid in the presses that contain the court rolls. Speaking to antiquaries, I need not apologise for a little enthusiasm in genealogical research. The anciently renowned and great historical houses have their pedigrees in the College of Arms, but a great proportion of those anciently renowned and great historical houses have done their work, become extinct in the male line, and left only a thin traceable line even in the noble families of to-day. Other great houses are springing up and having their day, both in England and in the colonies and in America. And the instinct of lineage is a very strong instinct, and however proud a man may be of having made his own way in the world, and being, as it is said, his own ancester, every man who does so rise as to wish his descendants to look back gratefully to him, will have some slight wish, I think, to realise the fact that he himself has sprung from honest parents, and will pay some attention to the growth and continuity of his own family. I wish that parish registers were cared for as they should be. They are certainly much better cared for than they used to be, and there is no wholesale destruction going on amongst them. But it is otherwise with the Court Rolls—whole series of them may be found in the booksellers' catalogues at waste-paper prices. In these days, when champagne can be made from petroleum, to what base uses might old parchment be put! Just think that in a glass of jelly or a basin of soup you may be swallowing the proof of your descent from one of the barons of Magna Charta, or from one who drew his bow at Hastings. His lordship concluded:—Brother antiquaries, we have not the whole field of knowledge to ourselves; there are critics who call anything that they do not know themselves,—a sufficiently wide material in truth,—"old rag bags," and there are politicians who think it a real blessing to mankind to destroy anything that is old; do not let them retort upon us that the sole object of antiquarian research is that which is of no use, but is ready to vanish away. There is a correlation of all historical and scientific, theoretic and scientific research, of all modes of research, in fact. But both altogether, and each one, requires sympathy, patience, modesty, and, I may add, a little grain of scepticism, such as is content, in all matters that depend on discovery, with a little less than perfect infallibility.

In the same section, the Rev. G. F. Browne followed with a paper "On Early Sculptured Stones in Cheshire." Papers by Mr. Henry Taylor and Sir James Picton were read in the Historical Section. To these we may return.

As we briefly mentioned last week, the Architectural Section was opened on Thursday, August 12th, by an address given by the President of the Section, the Right Hon. A. J. B. Beresford Hope, M.P.

Mr. Beresford Hope began by warning his hearers that they must not expect from him any very solid contribution to the great edifice of human learning which it was the object of the Institute gradually and securely to build up. He said he wished rather to put forward a few suggestions as to the working of the machine, for it seemed to him that, as President of that Section, he occupied somewhat the same position as those useful, though humble, individuals in great manufactories whose business it was to oil the wheels. The subject of architecture, which was to engage the attention of the meeting, was a strangely varied as well as a most important one; for architecture presented itself in so many relations, it had so many different aspects. The first and greatest distinction to be drawn was that between the architecture of the past and the architecture of the future. Then, too, architecture was at the same time such a practical thing, and it was an artistic thing too. In all those aspects the relations of architecture to archæology came in to assist in the solution of various problems, the solution of which was very difficult indeed. That ought to be an object to be borne in mind when the members of the Institute met together to exchange notes or to mourn over what they deemed to be vandalisms. Now what was the position of the archæological architect? Was he always popular, and was he doing good work? Whether he was popular or not, he was doing very useful work, and, perhaps, even if he was unpopular as an architect he was doing useful work as an archæologist. But there was one great difficulty staring them in the face. The practical character of architecture made it necessary for the architect to concern himself with the building of dwellings in which a man could live without being perpetually in danger of catarrh or blood-poisoning. The architect must also build temples to worship in, but those temples must be so planned and arranged as to conform to the religious instincts and wants of those who were to worship in them. It had also to be borne in mind that while we had only a certain acreage in England, there was a large and growing population. So the new wants of civilisation made things apparently dangerous, which had formerly been overlooked. Woe to them all if they did not do justice to those matters. Opposed as he was to the sacred legacy of the past, in the shape of buildings religious, secular, and domestic, which gave us such a real idea of the life of our ancestors, being needlessly frittered away, he, nevertheless, recognised that the architect had to consider the needs of the future, and the requirements which had grown out of the triumphs of science. There was an awkward, ugly word which had been invented of late years; but it was a blessed word in some respects, because it meant health and long life. That word was "sanitation." Sanitation stared us in the face everywhere. How were we to go on without sanitation? And how was sanitation to be enforced without detriment to the old and the picturesque? Those were questions with which we had to deal in the present day. He was very well assured, speaking seriously, that no greater blow was ever struck at archæology, no greater difficulty was ever propounded for solution by archæologists, than when our sanitary lights passed a decree forbidding the continuation of the old dear domestic cesspool. As long as the cesspool existed the old Tudor and Elizabethan houses of the country were comparatively free from molestation. But now, what was the first thing that happened when a man came into possession of an old Tudor house? Did he content himself with admiring the carving? Did he sit down to table in the hall with his hat on his head and dressed in the costume of the period to which the house belonged? He might do all that and much more with the most archæological accuracy. He did nothing of the sort, however, but called in the sanitary engineer, who tore up floors, pulled down panellings, and generally disturbed and more or less destroyed what was old. In the case of some old moated grange, perhaps, an iron tube would be carried across the moat in order that the moat might not become the rich receptacle of all the treasures of the house. He could imagine Mr. Stevenson, or some other delineator of the grotesque and horrible, telling some such story as this:—"A very good young man, a very enlightened young man, had a visit one morning from a fairy, and the fairy tells him that some grand old mansion (say Haddon Hall) had been, in a fit of capricious generosity on the part of the Duke of Rutland, handed over to him, with sufficient means to keep it up. We can imagine such a young man, full of archæological enthusiasm, what a state of ecstacy he would be in at being the recipient of such a gift! But a second fairy comes in and says:—'By the way, about that gift. The house is given you on condition that you live in it!' Now he is a man of great taste and a member of the Archæological Institute. At the same time he is a man who is careful about his health. So what is he to do and how is he to live in the Hall? Shall he live in the old building, with all its picturesqueness and discomfort, to be killed by catarrh or poisoned by the cesspool? Or shall he call in an architect to make the place habitable, and at the same time something very different to what it was in Dorothy Vernon's time? For to make such a place fit for the conditions of modern life would be to ruin it by internal changes, and hardly less so by the addition of excrescences which would alter the aspect of the place almost beyond recognition. Whatever he did, it was quite certain that he would be the object of the vituperation of all archæologists, who would regard him as a Vandal." He gave them that little parable of the Squire of Haddon Hall because it exactly served to illustrate one phase of the problem which they had to solve. If any of the members of the Institute were members of a Board of Health, they would be the better able to understand such difficulties as those to which he had referred. The case was, however, different when he came to our churches. Some years ago he was an earnest supporter of church restoration, because he was an ecclesiologist before he was an archæologist, and he still was an ecclesiologist. No doubt the ecclesiologists had made mistakes half a century ago, when they had a trifle less experience than they now possessed. In the old days of church restoration they used to move the monuments about in a most wonderful way. In that way they incurred a good deal of odium, which was not altogether unmerited. But the people who were loudest in condemning them were, taken all round, rather more ignorant than they were themselves. But now a more sober, a more reverential idea of church restoration had grown up. They tried to be reverential in the old days, but it was the reverence which only took one point of view. We were taught now to look at our churches all round,—as wholes. The question of church restoration was now only a question of degree. The man who could argue that churches, so long as churches, were churches, must not be restored, was a man who would, in Canning's words, "say anything." The question should always be, "What is the least that can be done to bring out the uses of the churches, to make them useful and yet to preserve the archæological features? He remembered a Collegiate church in the West of England which was some years ago restored by one of the most eminent ecclesiastical architects of his day, who ruthlessly altered the church, destroyed much interesting work, and revolutionised the church in order to make the church more convenient for current worship. That was a most unjustifiable proceeding, but it was a proceeding such as would not be dared again by an architect of eminence. The question of church restoration was, he repeated, a question of degree. Some ecclesiologists were, no doubt, too revolutionary in their changes, though perhaps the archæologists were not revolutionary enough. The attrition between the two parties would no doubt result in good. Common-sense would come in and make its influence felt. The instinct for the beautiful, reverence for the past, and the belief in history, and, on the other hand, practical necessities, make themselves felt and help to bring about the happy mean between the two extremes of over-restoration and no-restoration. It should be remembered that archæology had its limits. The archæologist was not bound, in the nature of things, to look upon a house as a place where a man must live. The archæologist only cared for the preservation of an old house, whether it was fit to live in or not. Then there came in the question of sanitation. He did not know whether any of his hearers had seen a drawing some time ago which appeared in the *Builder*, and which made a great impression upon him.* It was by Mr. H. W. Brewer, an artist who drew as if he were an architect. It was a representation of a make-believe German city of the most picturesque period of the transition between Gothic and the Renaissance, a beautiful minster being shown in the middle of the picture, surrounded by a number of picturesque buildings, the Rathhaus or Town-hall included. But there was not a single human being to be seen in the picture, and the streets and steps of the houses were covered with a growth of weeds from long disuse. The story which the picture was supposed to illustrate was that of a city which had been entirely denuded of its inhabitants by some pestilence or epidemic. In the middle of the picture, and underneath some of the buildings, was the trace of what, once a clear and beautiful stream, had been converted into a loathsome sewer,—the main sewer of the town, and, no doubt, the source of the drinking-water of the city. That picture, which was a most pathetic one, teaching a great lesson, did not receive so much attention at the time as it deserved. To sum up, architecture was a pursuit in which the variety of considerations with which it had to grapple was so great, so important, and in some respects so incompatible with archæological deference to the past, that no one man,

* "Deserted." See *Builder*, vol. xlvi., p. 24.

nor any one school of men, could wholly succeed in reconciling the architecture of the past, the architecture of history, and the architecture of old domestic and ecclesiastical life, with the architecture of our present everyday social wants.

On the motion of the Duke of Westminster, a vote of thanks to Mr. Beresford-Hope for his able and interesting address was carried by acclamation, and the section adjourned.

Subsequently the Cathedral, St. John's Church and the adjacent ruins, and Eaton Hall were visited, and in the evening the Mayor gave a *conversazione* in the Town Hall.

On Friday, Malpas, Nantwich, Acton, and Bunbury churches, and Beeston Castle, were visited.

In the evening, in the Architectural Section, Mr. G. W. Shrubsole, F.G.S., read a paper on "The Age of the City Walls of Chester." He remarked that Pennant had stated over a century ago that the form of the city evinced its Roman origin, but that no part of the old walls remained. The latter remark had naturally evoked considerable difference of opinion, and when, about fifty years ago, a zeal was shown for the preservation of the local antiquities, for the first time the claim was advanced that a large part of the north wall on the east side of the North-gate was Roman work *in situ*. Since that time it had figured as such in standard works, although considerable discussion had arisen upon the point, which was a most interesting one, and one that the last quarter of a century had given greater facilities for rightly judging than any previous period. Mr. Shrubsole continued,—During that interval, large sections of the wall have been laid open for necessary repairs. Besides this, many excavations have been purposely made at the base of the wall, at the more interesting points, to ascertain its peculiarities and character. In dealing with the age of the walls it is my intention to limit my remarks to one period involved in the question raised by Pennant. Does any part of the Roman wall still exist in the present walls of Chester? It were profitless, and it is well-nigh impossible, to judge by mere appearance of the age of a structure, on the whole so destitute of distinctive architectural features, which has had to be repaired or remodelled every century or two. Among much that is uncertain, one period we know stands prominently forward for distinctive recognition in the use of stone, tiles, and mortar in its constructive work, which enables us to distinguish it from all others. I allude to the period of the Roman occupation of Britain. The position that I take up on this question is opposed to the modern view, believing that, however pardonable may be the claim for the Roman age of any part of the city walls, it is one not borne out by anything to be seen there at the present time. It is an element not without value in this case that the oldest writers on the subject, such as Camden, Pennant, Ormerod, Tyson, and Henshall, make no such claim for the walls. The opinions held by those writers, and even older ones, might be summarised in the words of Ormerod:—'The walls of Chester follow the outline of the Roman work, and probably stand on the Roman foundation.' On the general subject, it may be said that historical evidence is against the probability of any portion of the Roman wall being extant. The facts bearing on the case are that, after the departure of the Romans, the Britons, Danes, and Saxons each in turn assailed the walls and helped on their demolition, leaving them for Ethelfreda to rebuild, and, it said, enlarge. Again, we find in Norman times an imperative order was issued for the rebuilding of the walls, to be followed by a fine for non-appearance on the part of holders of land. For their history during the next 500 years the Patent Roll gives us an insight into the state of dilapidation into which they had fallen from natural decay and intestinal strife. Subsequently, in the Civil War, the walls suffered severely, serious breaches having been made on the face of the wall. In this condition they remained until, as the inscription on 'Pemberton's Parlour' tells us, 'In the eighth year of the reign of Queen Anne divers wide breaches in the walls were rebuilt and other decays therein were repaired, 2,000 yards of the pavement were now flagged or paved, and the whole repaired, regulated, and adorned at the expense of 1,000*l.* and upwards.' From this time a trifling tax on Irish linen imported into Chester provided a sufficiently ample fund to keep the walls in good repair. Under any circumstances it is impossible to believe that a perishable stone of the nature of our sandstone should have held together as a structure for 1,600 years. It is not even credible that 200 or 300 yards of it should have remained intact. It is far more probable and consonant with observation that there may have not been one, but four walls, in the space of time over which its existence has been spread. Proceeding to examine the parts of the wall for which a Roman origin is set up, Mr. Shrubsole referred to the group of large stones found on the outside of the wall near Blackfriars, midway along the Roodee. One fact alone, he said, disposed of its claim to Roman origin. The base of the stones rested upon a quicksand which was the bed of the old river. To have neglected the solid ground above, and to have built the wall of the Castra on quicksand in a hole 50 ft. below the level, was a mode of proceeding he could not imagine any military engineer capable of, least of all a Roman engineer. In examining the reputed Roman work at the Kaleyards, he accounted for the single course of stones there found by the fact that some centuries ago the city wall stood on the spot where these stones now stand. The foundation of clay proved treacherous, aided by the loose ground of the fosse in front and the outward thrust of the ground of the churchyard, and these causes proving too much for the stability of the wall, it was pushed outwards to such an extent as to be useless, and it was dismantled, the base being left in the place where it was found, and the new wall built inside the old one. The Roman work *par excellence* of some authorities was to be seen on the east side of the Northgate, between it and King Charles's Tower. Owing to certain clearances, the wall was now to be seen under exceptionally favourable circumstances, but, looking to the work as a whole from the base to the top, it must be confessed that for genuine Roman work it presented several anomalies, if not unique features. They were supposed to see here a wall which, from the plinth to the cornice, was believed to have been part of the Castrum which encircled Deva on that side. The base had a very English-like look about it. The irregular size of the stones, large and small intermixed, had not the characteristic appearance of Roman work, and the whole was crowned by a cornice, an unparalleled example so far as the walls of Roman castra in England were concerned, and more nearly allied to the debased Classic cornices to be seen in the front of some of the gabled houses in Bridge-street of the Jacobean age than anything Roman. In 1884 a number of excavations were made in order to examine the inner face of the wall, when it was found that there was a singular absence of everything Roman about it, while all its affinities bespoke its connexion with the work of the last two or three centuries. Other structures in the city, such as Julius Cæsar's Tower at the Castle, and the Old Shipgate near the river, had been spoken of as Roman, but after very superficial examination,—seeing that neither of the places alluded to were 500 years old,—they were really out of the discussion, for most certainly neither of the spots were included within the Devan camps. As to the construction of the older portions of the walls, during the past twenty-five years he had on various times seen hundreds of yards of the present wall laid open for necessary repair, but in no instance had he seen the faintest approach to Norman work *in situ*. After referring at some length to the discussion as to the material of which the walls were constructed, Mr. Shrubsole said that all the evidence to hand went to show that the Romans in their several works made free use of local stone, as might be seen in Handbridge, where several hundred yards of rock had been excavated, and the microscopic examination of the stone showed that the stone in the Northgate wall was identical with the local stone. There was, therefore, no warrant for the supposition that the stone had been brought from a distance, and the wall, therefore, could not claim a longer life than was usual with a stone of its kind. The way in which the error as to the extreme age of the walls had arisen was readily explicable. If the opinion rested alone on a passing or superficial examination, such was the extent of the "weathering" of the stone and the seeming antiquity which one or two centuries would confer upon it that it seemed natural to infer its antiquity was great. Looking at all the aspects of the walls, he was of the same opinion as Pennant, and had come to the conclusion that nothing in the walls dated further back than the reign of James I. and Charles I.

A discussion followed.

On Saturday there was an excursion to Delamere Forest to see the remains of the Roman road to Mancunium (Manchester), Tarvin Church being visited *en route*. On Eddisbury Hill some remains of early fortifications were examined. In the evening there were sectional meetings.

In the Architectural Section, Mr. I. Matthews Jones, City Surveyor, Chester, then read a paper on "A Roman Hypocaust lately found in Chester." He said that in June last the work of laying a connecting sewer from the intercepting sewer on the Roodee, to drain Blackfriars and its district, was commenced. Having some years ago discovered an interment (supposed to be Roman) near the line of the new sewer, on the outside of the walls, Mr. Jones said he thought it likely that the further opening of the ground in the neighbourhood would yield other proofs of the Roman occupation of the city. Proceeding onwards from the Roodee, the excavation passed through clay under the city wall's foundation. Near the centre of the roadway, at a depth of 13 ft. below the present surface, the remains of a hypocaust, in a tolerably good state of preservation, were discovered. The western and eastern walls measured 2 ft. 9 in. in thickness at the top, with a slight batter, the eastern wall having a slight batter and set-offs, and having, under a layer of clay, the concrete floor. Several pillars and a specimen of the masonry were cut out, and had been deposited in the Grosvenor Museum, Chester. To the eye of a practical man the masonry of the walls of the hypocaust appeared to approximate in many respects to that of several portions of the city walls. No trace of bonding tiles was found, though the masonry discovered was enclosing so large a number of tile pillars. The plan seemed to be that of a chamber with a semicircular end, facing west. The internal dimensions of this chamber, on the longest line exposed to view, viz., from west to east, measured 19 ft. 8 in. The width could not be ascertained, the trench being only 2 ft. 6 in. wide, and the probing under being attended with danger, owing to the superincumbent mass of filling-up stuff and the wet mud at the bottom. In the direction of the longest line before mentioned there were the remains of twelve pillars, a series of four of which supported, for a distance of 5 ft. 3 in., a concrete floor, in splendid condition, from 6 in. to 7 in thick. The supporting pillars also rested on concrete, the under portions being of loose material. These pillars were found in a perfect state, the remaining ones being more or less destroyed, though ample portions of them were left to enable one to identify their original position. The upper layer of concrete had, for the distance named, a squared, worked edge, and seemed to have been stopped originally at that point. Large tiles abutted against the same, but little trace of these were found. The number of tiles forming a pillar were ten in number, the base or foot tile being 10½ in. wide, 6 in. long, and 2 in. thick. Then came seven tiles, 8 in square, superposed to form the shaft; then the under-cap tile, 12 in. square and 1½ in. thick; and then the upper cap tile, 17 in. square and 2 in. thick, and the concrete-floor-supporting tile, extending from pillar to pillar, 2 ft. square. All these were bedded on each other with mortar. It should be mentioned that the pillars found adjoining the wall were composed of stone slabs cut as nearly as possible to correspond with the form and dimensions of the tiles in the other pillars. Broken flue-tiles were also found in the filling-up stuff there, and a flue-tile which stood vertically near the last wall-pillar, — whether on its original position could not be verified, was removed. Bones, tiles, and coins were found during the course of the excavation, and a tile, bearing an inscription, was handed to the Curator of the Grosvenor Museum. It should be noted that the level of the bottom floor of the hypocaust was 40 ft. above Ordnance datum, corresponding with the present level of the street at the Water-gate, not many yards distant. The present Roodee was 21 ft. below the level of the floor, and the present parapet wall some 14 ft. to 16 ft. above the floor. The present city wall was distant about twenty yards from the semicircular end of the hypocaust, and it was to be regretted

that the discovery was not made at an earlier date, as it might have materially affected the conclusions which had been come to as to the extension of the town-wall, as the centre of the hypocaust was shown to be distant only from twelve to fifteen yards from the supposed extended wall. In conclusion, Mr. Jones urged the desirability of further exploration of the locality, and delivered a little homily the purport of which was that the maxim "Honour to whom honour" was not always borne in mind and acted upon in Chester in regard to antiquarian discoveries.

On Monday last Hawarden Castle, Mold, Caergwrle, and Gresford were visited, and in the evening the concluding general meeting was held, as well as a meeting of the Architectural Section, when Sir Llewelyn Turner read a paper on "Carnarvon Castle."

On Tuesday last the visitors proceeded by rail to Flint, Conway, and Carnarvon castles, and so terminated a very successful round of meetings and excursions, which latter were fortunately favoured with, on the whole, very good weather.

We hope to conclude our notes of the meeting in our next.

MANCHESTER JUBILEE EXHIBITION BUILDING.

At a meeting of the Council of Guarantors for this Exhibition, held on the 12th, it was decided to select the designs bearing the motto: "Small cost, large re-sale," which were found to be by Messrs. Maxwell & Tuke; and that the remaining designs be awarded the three premiums as follows:—"Expectation" (Messrs. Salomons & Ely), 50*l.*; "Vivat Regina" (Mr. A. Darbyshire), 30*l.*; "Spes" (Messrs. Pennington & Bridgen), 20*l.*

The estimated cost of carrying out the selected design is 32,653*l.* We are indebted to the *Manchester Courier* for the following particulars in regard to the selected design:—

The building will be constructed chiefly of iron and glass, to some extent after the style of its famous prototype at Sydenham. From the centre rises a dome, in front of which, over the principal entrances, are two small towers.

The architects state that in preparing the plans of the building they have borne in mind the suggestions of the assessor as to (*a*) rapidity of construction, (*b*) safety from fire, and (*c*) reduction by cost of re-sale. They had practically covered the whole of the land off Talbot-road as well as a portion of Hayesleigh, and such portions of the Botanical Gardens as were required to form the approach from Chester-road. The extra area covered, inclusive of "Old Manchester and Salford," was about 40,000 square yards. The plan included a portion of the Botanical Gardens. The trees about "Old Manchester and Salford," the open-air *café*, and the gallery of approach were carefully delineated from actual measurement. They had narrowed the new portion of the gallery of approach to avoid the destruction of some of the noblest trees in the garden, which must be sacrificed if the 60 ft. gallery was to be carried its full width to the main building. The new building is divided into five sections. The general plan of the main building consists of a lofty nave and transepts arranged in the form of a Latin cross, with low buildings supporting it on each side. These low buildings or courts are each 30 ft. wide, and this division has been preferred above the usually greater width, as it allows in each court side exhibits and a central gangway. Section 2 (machinery in motion and processes) is divided into three sub-sections, one for motive power, electrical machines and machinery in motion of a hazardous description; one for machinery in motion not hazardous; and the south-west angle (separated from the rest by the nave) for processes not requiring power and not hazardous. The Section 4 occupies the portions comprising "Old Manchester and Salford," and is partly used as a screen so that the whole of the front towards the Botanical Gardens will be faced with ancient buildings representing portions of "Old Manchester and Salford" or historic buildings in the neighbourhood. Section 6 (fine arts) is separated from the rest of the building by fireproof screens. The doorways are deeply recessed to prevent the spread of fire. In Section 7 is a music-room 150 ft. by 100 ft., divided from the rest of the building with fireproof screens. This hall is accessible from the gardens or from the central nave. In addition to this room the architects provide a band gallery at the end of the north transept, so arranged with movable shutters that the band can be heard either in the building or in the gardens.

The gallery of approach from Chester-road will be filled with statuary, interspersed with shrubs and flowers, so as to form a striking *coup d'œil* upon entering. The entrance from Talbot-road is marked by a carriage porch the whole width of the street. The old 60 ft. gallery, it is added, will in all probability be retained after the exhibition as a permanent exhibition, and for this purpose the designers propose to encase it almost entirely with glass. The purlins would need a little strengthening, but otherwise the building was, in their opinion, strong enough for its purpose. The curved portion of the top would be covered with corrugated iron bent to the sweep. Considering the valuable collection that would be housed within the building, and the enormous charges made for insurance, which in this case would for building and contents, if fully covered, amount at least to 4,000*l.*, they had used nothing inflammable in the building except the windows, the skylights, and the outside cornice and the doors. Always bearing the above consideration in mind, and after a careful study of the strongest materials, and searching calculations as to the first cost, the ease and economy of erection, the value of the materials if broken up and re-sold, and the value of the building if sold for re-erection, they had decided to recommend the use of gas or water pipes as the material of which to construct the framework of the building. The Corporation of Manchester used every year an enormous quantity of gas-tubing of the sizes specified, and as this tubing would be improved by the coat of paint it would receive in the building, the cost of the building by its use would be greatly reduced: (*a*) by the re-sale value of the materials; and (*b*) the ease with which the same could be constructed and taken down. According to the plan, the whole of the framework of the building, except the roof of the nave and the dome, would be constructed either of cast or wrought tubes, including the pillars, principals, and purlins. The architects furnish details showing the method of construction. All divisions in the building, where not brick, will be made with Johnson's patent wire and plaster studding. The outer casing to the building, where not glass, will also be made of this material, but the exposed surface will be cemented. The question of a fireproof floor being of paramount importance, it is proposed to use cement slabs, 4 in. thick, as set forth in the details and the sample of the material sent along with the plans. With regard to protection from fire, the architects state that they have so divided and separated the buildings that the risk of fire has been reduced to a minimum. The central portion of the building has been divided by four 14 in. brick walls from the sections on either side, so as to prevent a spread of fire. A fire occurring in one of the art-galleries, for instance, could not possibly spread to another gallery or to the main building. They recommend, in addition to these and other precautions, that wide curtains be hung between the brick walls below the door to within 7 ft. of the floor, and that these should be dropped down to the floor after the Exhibition closes at night. On the subject of reduction of loss by re-sale, the architects state that, the framework of the building being made of iron tubes, nothing but the special couplings would be waste or scrap. Looking at the building's capacity for sale or re-erection, the nave would form an excellent workshop, or it could be sold in sections.

Illustrations.

THE CHURCH OF THE HOLY TRINITY, SOUTH SHORE, BLACKPOOL.

The new church will replace an old brick building with galleries, which at present stands on the site. Owing to the surrounding graves, no extension westward was possible, but the new building will extend much further at the east end than the present one. The plan consists of wide nave (with aisles as ambulatories only) and double transepts.

The chancel is large and of good proportions, and has, on the north, clergy and choir vestries, with organ-loft over them; and a chancel aisle arranged as a chapel on the south. At the west end a gallery for school-children is provided, with separate approach. The church will accommodate 1,000. The materials used will be Yorkshire parpoints with red Rainhill stone for the exterior, with North-country green slate roofs.

The interior throughout will be finished in buff terra cotta.

The tower (some 150 ft. in height) will be a prominent object in the flat surrounding country, and will, standing on the coast, also serve as a useful landmark.

Mr. R. Knill Freeman, of Bolton, is the architect.

DESIGN SUBMITTED FOR CHELTENHAM GRAMMAR SCHOOL.

The plan for this design is arranged on three sides of a quadrangle, so as to make the most of the frontage to High-street. The class-rooms are placed on the side furthest from the public road; the Assembly Hall (30 ft. by 51 ft.) on the left hand side with separate entrance to High-street, if required for public gatherings. This would deaden the sound from the street. On the right hand side of the quadrangle is a gymnasium next to the street, with Board-room adjoining. The class-rooms are easy of access from the principal entrance, assembly-hall, head master's room, and play-ground. On the first floor is arranged a chemical laboratory and lecture-room, art and cast rooms, museum and library; the art-room being well lighted from the north. The caretaker's house, heating-chamber, and drying-room are arranged in basement. In this plan is a side entrance for access to back premises and play-grounds, also convenient arrangement for future extension to accommodate 100 more boys. The whole of the main buildings can be erected without disturbing the two schoolrooms in present use. It is proposed to build the walls of best red bricks with stone or terra-cotta dressings with lead light windows glazed into stonework. The estimated cost is £5,800. The design is by Messrs. W. H. Sugden (Keighley), and Fairbank & Wall (Bradford), architects, and was submitted under motto "Renaissance."

MAESMAWR HALL.

This extremely picturesque old house is situated between Newtown and Llanidloes, in Montgomeryshire. The oak quarterings are arranged in greater variety than is usually the case in this county, and the effect of the whole composition, standing as it does at the end of a long avenue of elms, is very charming.

The end gables are treated more plainly than the front, the quarterings throughout being upright and about 7 in. on the face, never more than 9 in. apart, the interspaces filled with "wattle and dab" work, whilst the corner posts are much stouter, varying from 9 in. to 12 in. square.

The interior consists of a hall, about 19 ft. square, and the "wainscot parlour," 19 ft. by 14 ft. 9 in., arranged on each side of the great chimney, the porch, 16 ft. long by 8 ft. 6 in. wide, connecting the two, and a fine oak staircase of William or Anne's reign on the side of the chimney-stack opposite the porch. Modern drawing-rooms and kitchen offices are in the rear.

There is no record of the date of building, but it was probably constructed towards the end of the sixteenth century.

Thos. Edward Pryce.

PENARTH.

A large farmhouse, near Newtown, of an earlier and plainer type than most Montgomeryshire houses, and picturesquely situated on a high bank overhanging the Severn, which flows round the rear of the house.

The timbering is very massive, the angle-posts measuring as much as 12 in. square, and the cambered beams nearly 2 ft. on the face.

The interior has been much modernised, but, like most of these old houses, it consisted of a large central hall or common room, with the kitchen and offices in the wing on the right, and a large parlour and small room in the corresponding wing on the left. Cellars and a large milkhouse form a half-basement behind.

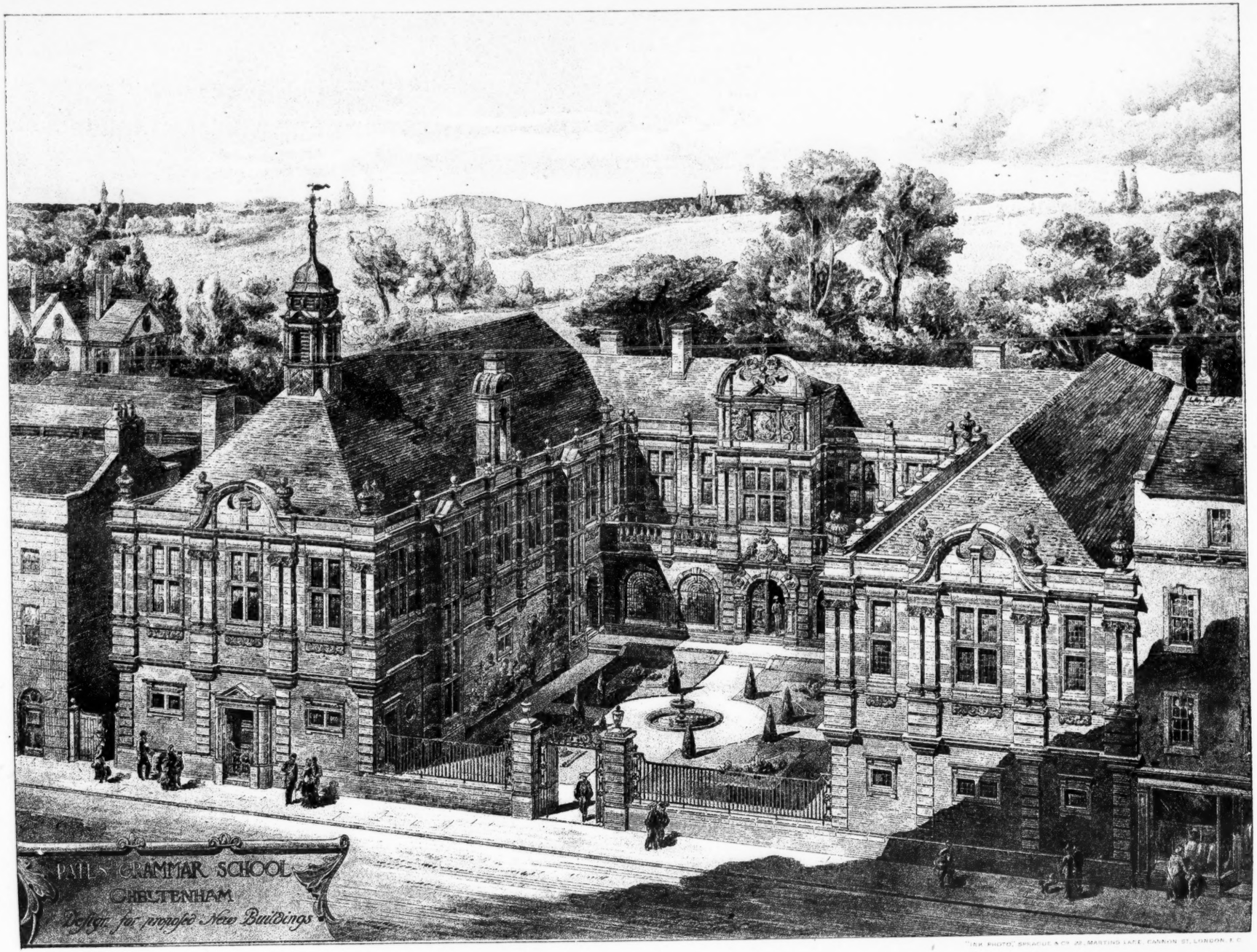
Thos. Edward Pryce.

Whiteman & Bass *Photo-Litho.* London.

Printed by Wyman & Sons, Gt Queen St London, W.C.

MAESMAWR HALL, MONTGOMERYSHIRE.——Drawn by Mr. T. Edward Pryce.

Drawn by Mr. T. Edward Pryce.



CHELTENHAM GRAMMAR SCHOOL COMPETITION.

DESIGN SUBMITTED BY MESSRS. W. H. SUGDEN (KEIGHLEY,) AND FAIRBANK AND WALL, (BRADFORD,) ARCHITECTS.

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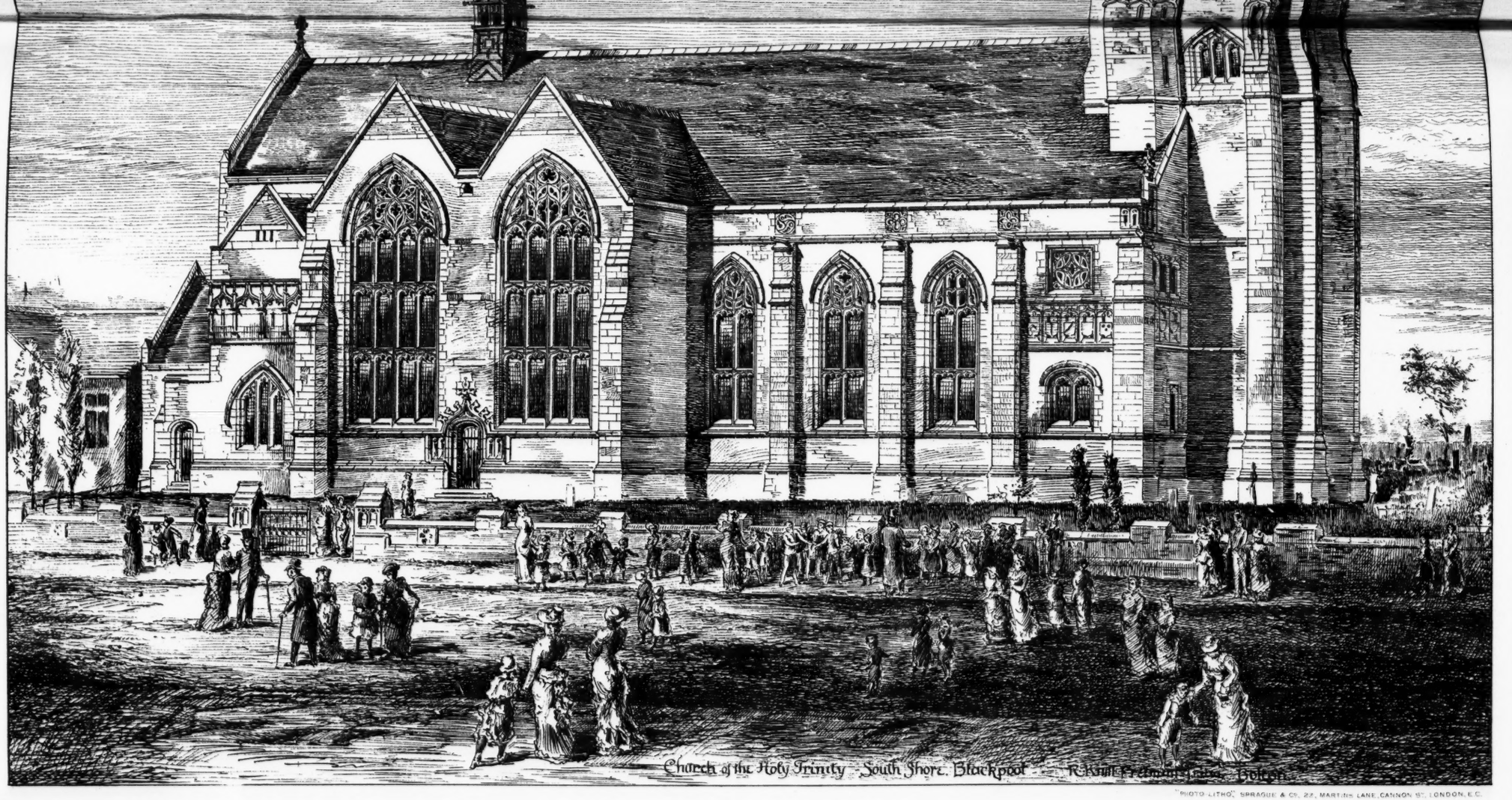
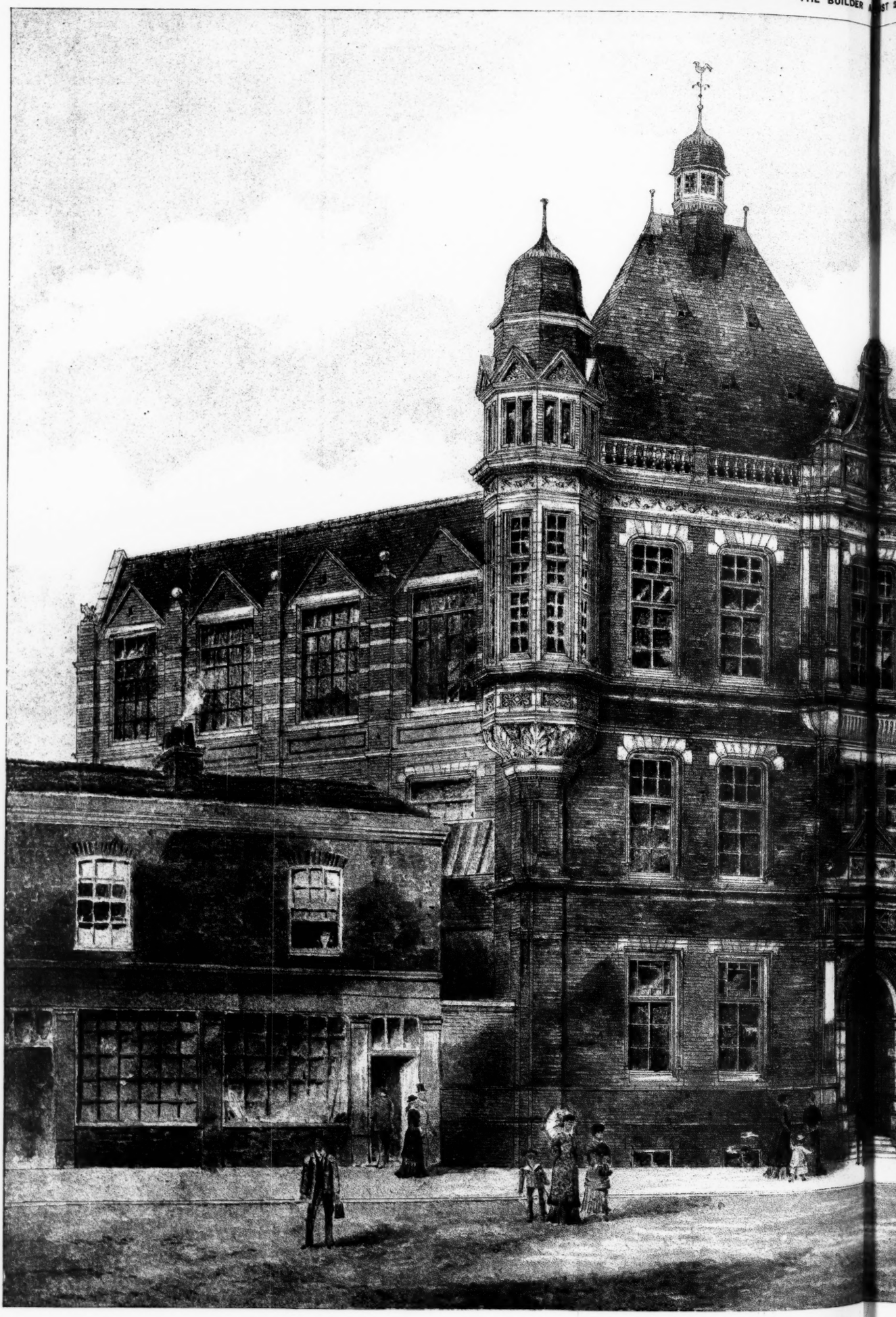


"PHOTO-LITHO" SPRAGUE & Co. 22, MARTINS LANE, CANNON ST. LONDON, E.C.

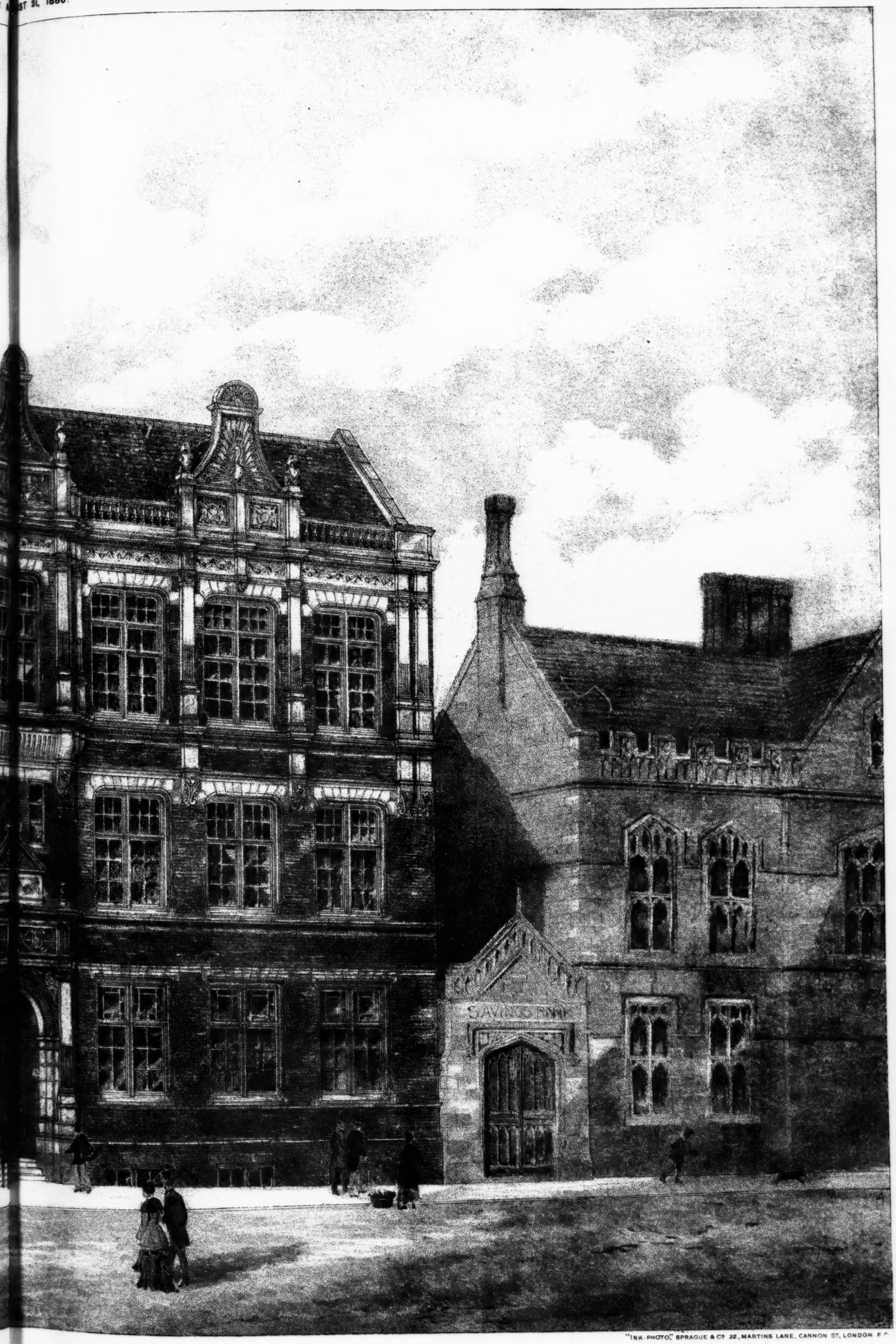
CHURCH OF THE HOLY TRINITY, SOUTH SHORE, BLACKPOOL.

MR. R. KNILL-FREEMAN, F.R.I.B.A., ARCHITECT.



THE GROSVENOR MUSEUM, AND SCHOOLS

MR. THOMAS M. LOCKWOOD



"INK-PHOTO," SPRAGUE & Co 22, MARTINS LANE, CANNON ST, LONDON E.C.

OLS OF SCIENCE AND ART, CHESTER.

ACKWOOD, ARCHITECT.

INDIA.

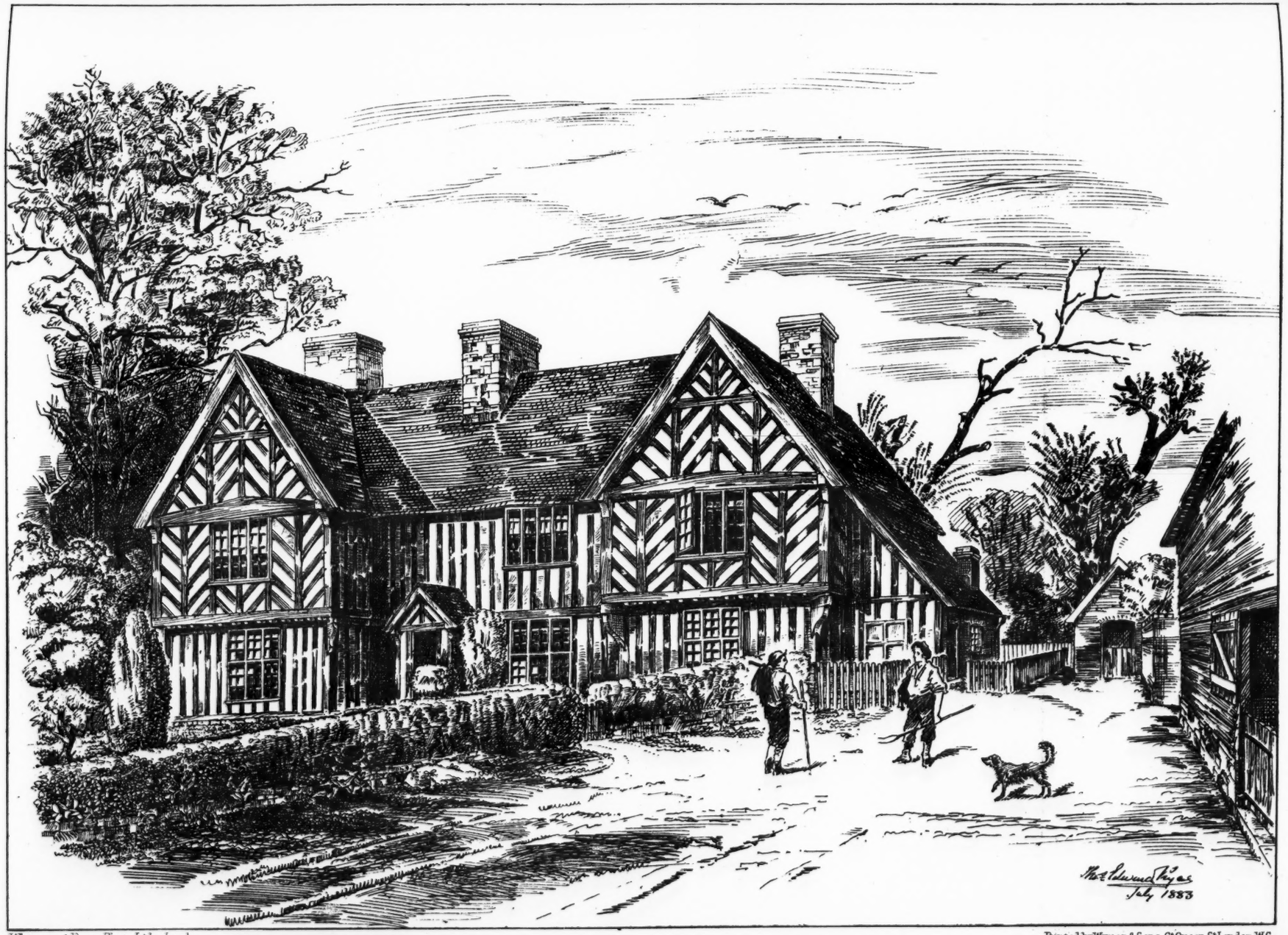
AUSTRALIA.

ENGLAND.

INK PHOTO. SPRAGUE & Co. 62, MARTINS LANE, CANNON ST, LONDON, E.C.

PANEL PICTURES IN THE INDIAN AND COLONIAL EXHIBITION.

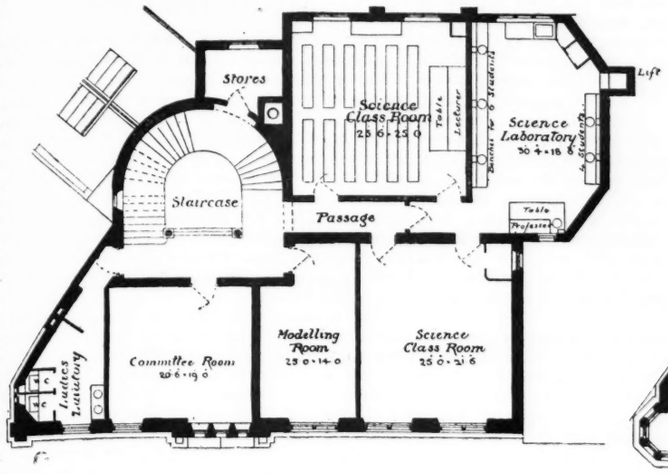
EXECUTED BY MESSRS. DOULTON'S "IMPASTO" PROCESS.



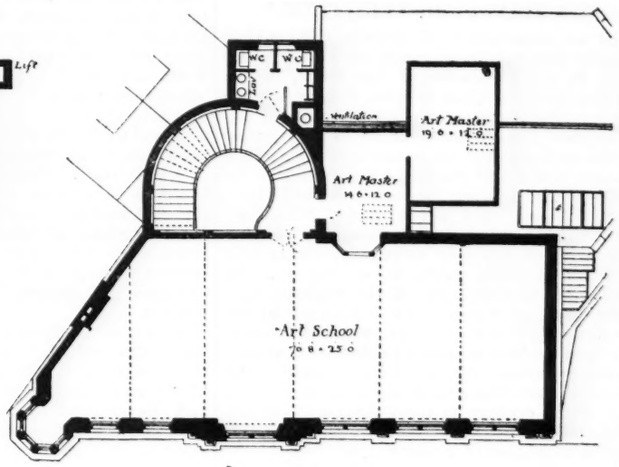
Whiteman & Bass, *Photo-Litho*, London.

Printed by Wyman & Sons, Gt Queen St London, W.C.

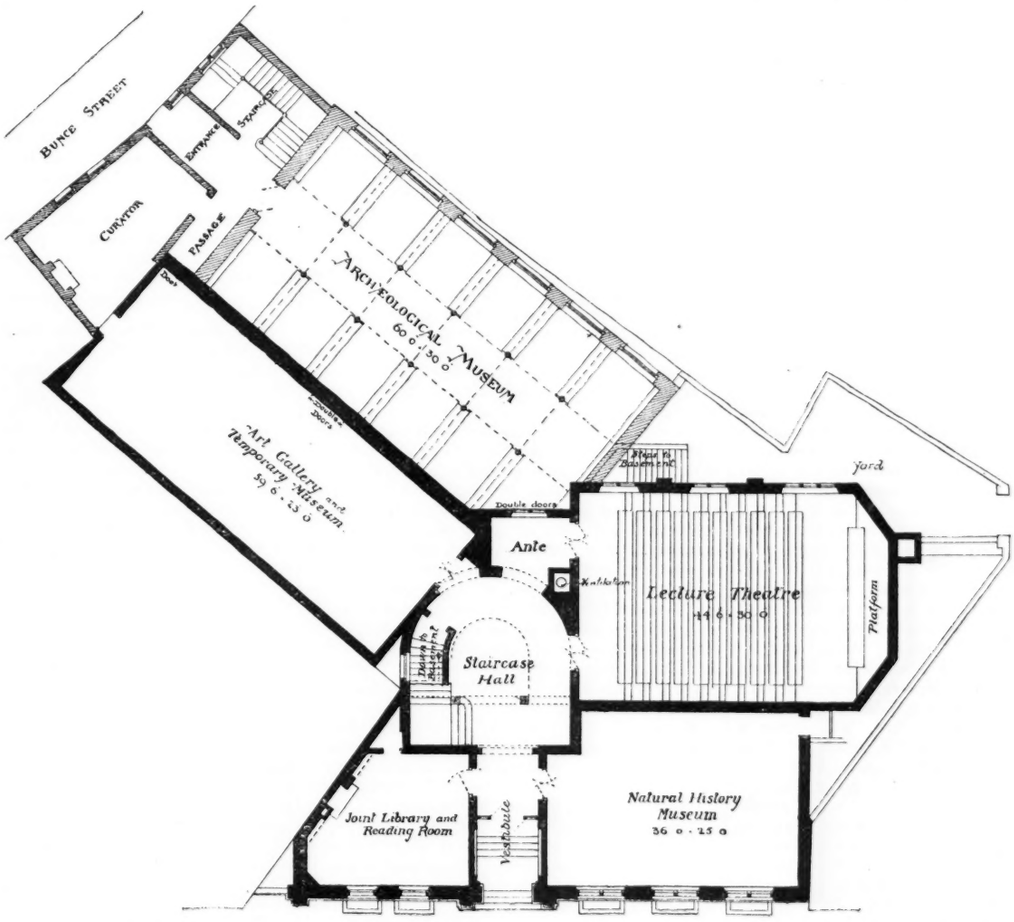
PENARTH, NEWTOWN, MONTGOMERYSHIRE.—Drawn by Mr. T. Edward Pryce.



1ST FLOOR PLAN



2ND FLOOR PLAN



GROUND PLAN

Grosvenor Museum, Chester.

GROSVENOR MUSEUM, CHESTER.

We illustrate this week the plans and view of the Grosvenor Museum at Chester, opened by the Duke of Westminster on the 9th inst., and of which we gave a full account in our issue of last week.

It will be seen that the ground is of irregular form, demanding considerable ingenuity to arrange the plan so that the entrance-hall should give convenient approach to the various departments.

The walls shown in black indicate the portions already built, which comprise the class-rooms for the science and art department, and the lecture-theatre; the walls on the ground plan lightly hatched show the portion to be built hereafter, comprising, on the ground and first floor plans, museums for archæology and natural history, with the curator's rooms, &c., and on the second floor the class-rooms for the more advanced pupils of the school of art department. It is hoped that these will soon be added to the building.

The architect is Mr. Thomas M. Lockwood, of Chester.

"IMPASTO" PANELS BY MESSRS. DOULTON & CO.

At the Indian and Colonial Exhibition the west wall opposite the turnstiles from Exhibition-road into the main entrance-hall is faced with slabs of terra-cotta painted in the "Impasto" process recently introduced by Messrs. Doulton & Co. The paintings are executed in coloured clays, which become incorporated with the body of the ware in the subsequent firing and glazing. The joints in these panels are made to follow the outlines or leading lines of the design, as in stained glass, and as pieces of large area can be safely used, the total number of joints in a panel of any given size is considerably reduced. Not only therefore is the labour of fixing less than in ordinary tile panels but the unsightly straight jointing is altogether avoided.

The subjects of the panels, of which we give illustrations, are as follows:—Of the three lunettes (each nearly 7 ft. high by 10 ft. wide) above the archways, the left-hand one (as fixed, —the upper one in our plate) is typical of India's native art, and represents an Indian potter working at his wheel, while a native woman is decorating the ware. The centre panel (lowest in our plate) is typical of Great Britain, as represented in her manufacturing industries; the figures are those of an engineer and blacksmith. The remaining lunette represents Australia, as typified by a gold miner and a farmer.

THE EDINBURGH EXHIBITION.*

In no department of artistic culture has greater progress been made in recent years than in the decoration of the home, in the making beautiful those articles with which we come in contact at some point or other of our daily life. That great advance has been made in the application of art to the industries of the cabinet-maker and decorator is manifested by the examples of their handicraft in the Exhibition. In the matter of "art-furniture" Edinburgh makers have, for a considerable period, held a high position, not only as regards the artistic qualities of their productions, but for the substantial thoroughness of the workmanship. They have, of course, been influenced by the changes which have taken place in public taste, but have avoided running to extremes and producing vagaries. A marked departure from the practice which was almost universal in the first half of the century is the substitution of the solid material for veneering, and the attention paid to soundness of construction.

The publication of Mr. Eastlake's "Hints on Household Taste" may be said to have added vigour to this impulse, and to have banished the sarcophagus sideboards and horsehair-upholstered sofas and chairs from the cabinet-making trade. In regard to textile fabrics the progress has been most remarkable. It used to be a matter of very great difficulty to procure a carpet or a set of hangings having the slightest pretentions to artistic beauty, either as regards design, colour, or texture; now the difficulty is to choose from the variety of beautiful fabrics presented to us.

Looking over the catalogue of the Exhibition we find that, in several instances, the manufacturers have secured the aid of a painter, sculptor, or architect, some of them ranking as Academicians. In this way the productions are not mere specimens of manufacture, but examples of artistic handiwork of a high order. Of this class the most striking in the Exhibition is the exhibit of Mr. William Adams, Queensferry-street, Edinburgh (Court 3, No. 924), containing, amongst other articles, a carved oak fireplace, the two side supports consisting of men in armour, and the lintel and overmantel decorated with scenes from Shakspeare; carved oak fire-place, having old Scotch Ingle-neuk, with satyr supports and carved lintel; Chippendale fireplace and overmantel carved in limetree; carved oak settle for entrance-hall, &c. The wealth of boldly-designed carving, representing scenes from Shakspeare and Scott in a very spirited and artistic fashion, and the scale upon which they are executed, would make these articles objects of interest and remark in the most sumptuous mansion. Messrs. George Dobie & Son, George-street, Edinburgh, in a pavilion in central court, No. 880, show a boudoir, study, and smoking-room, "illustrating the application of comparatively inexpensive fittings and decorations to such apartments in a middle-class house." The rooms are delightfully comfortable-looking, and the subdued harmony of colour pervading them is in every respect commendable. Few, indeed, are the middle-class houses where such satisfactory surroundings are found. Next to this (No. 881), Messrs. John Taylor & Sons, Princes-street, Edinburgh, have a pavilion fitted up in a more sumptuous manner. A massive oak sideboard, in the old Scottish style, and mantelpiece and chairs to correspond, are good in design and execution. The chairs were made from a design by the late Mr. Drummond, R.S.A. A high-class bedroom suite, in satin-wood, consisting of large three-doored wardrobe, washstand, toilet-table, Elizabethan bedstead, fitted with pale blue curtains, &c., are admirable of their kind. The workmanship is of the best, and the material choice. The wardrobe is a particularly handsome article of furniture, and the graceful drapery of the blue brocade hangings is in perfect keeping with the elegant bedstead.

Mr. Scott Morton has made for himself a name as a decorative artist. His Tynecastle embossed canvas, decorative furniture, textile fabrics, mantelpieces, &c., exhibited in Pavilion No. 882, sustain his reputation. The Tynecastle tapestry, which consists of canvas backed by strong paper, is embossed to any pattern, and can be coloured as desired, and is his speciality. Admirable specimens of it are shown. It is now extensively used, and has been introduced into many mansions, hotels, &c., throughout the country. A specimen, as used in the Hôtel Métropole, and others, for shields in St. Helen's Town-hall, which are exhibited, testify to its effectiveness as a decorative material. There are several figure panels in this material, designed by Mr. G. W. Stevenson, R.S.A., which show that it can be applied to decorative work of a high class. Photographs are exhibited of interiors in various mansion-houses, showing different modes of applying the material; and, besides articles of furniture of elegant design, there is a very beautiful example of silk weaving, designed by Mr. Scott Morton, and executed by Messrs. Varner & Ramon, of London.

A rival to the Tynecastle tapestry appears in the "Coriovellum" of Mr. Thomas Hall, George-street, Edinburgh (No. 908, Court 3). The designs are reproductions of old Cordova and Venetian leathers, the material being treated in a permanent way in colours and gilding, and coated with a hard enamel, rendering it impervious to damp or atmospheric influences, and making the surface washable. This material was shown in the Health Exhibition in 1884, and secured a bronze medal. It must not be supposed that because it is washable and can bear a great amount of wear and tear, that it is a coarse material; on the contrary, the examples exhibited possess highly artistic qualities, which are also exemplified in the Royal Reception Room in the Exhibition-buildings, which we should remark are furnished in an appropriate manner by the Messrs. Clapperton, Princes-street, Edinburgh.

Another new decorative material is that invented by Mr. Girvan, of the firm of Brown & M'Laren, Stirling-road, Glasgow, Court 3, No. 911. Upon Lyons satin, patterns are printed in distemper, producing a very brilliant result, but very soft and pleasing in its richness, something like shot silk, varying according to the light thrown upon it. The firm profess to have got over the difficulty hitherto experienced in hanging a large surface with satin, the joints being as perfectly formed as in any well-made wall-paper. Still another wall-decoration is the Lincrusta-Walton of Messrs. Frederick Walton & Co., Sunbury-on-Thames, which is a composition of linseed oil and wood fibre upon which figures in relief are produced. It has the desirable quality of being waterproof. It can also be moulded into forms, such as picture-frames, &c., examples of which are shown.

Messrs. Jeffrey & Co., of Essex-road, Islington, London (No. 919), exhibit some admirable wall-papers, excellent in design, and non-arsenical as to their colouring matter. Their exhibits include papers and embossed leather-papers, designed by Mr. Walter Crane and Mr. Lewis F. Day.

Messrs. W. Woollams & Co., of Marylebone, London (No. 920), have also an excellent display of non-poisonous and artistic papers and leather papers, including "Tergorine," an artificial leather, which is capable of being embossed, painted, and lacquered.

In this court, No. 3, are many other exhibits well worthy of attention, but which want of space prevents us from referring to in detail; we can hardly, however, leave the court without a passing glance at the pair of large painted figures which flank the carved mirrors and picture frames exhibited by Messrs. Ciceri & Co., No. 900, more strange than beautiful.

See p. 177, *ante*.

ARCHITECTURAL ASSOCIATION,

VISIT TO OXFORD, SATURDAY, AUGUST 21ST.

We have been asked to publish the following time-table for the benefit of members who wish to join in this visit:—

11· 0 a.m.—Arrive.
11·15.—Balliol College.
12· 0 noon —Schools in High-street (T. G. Jackson).
12·30 p.m.—Trinity College.
1· 0.—Wadham College.—(Lunch at Wadham by invitation of Mr. T. G. Jackson).
3· 0.—Bodleian Library.—(Meet party arriving by 1 p.m. train).
3·15.—All Souls' College.
4· 0.—New College.
4·45.—St. Mary Magdalene.
5· 0.—Merton College.
5·30.—Christchurch.
6·45.—Keble (Butterfield).
Tea and general look round.
9· 5 —Return to London.

The schools in High-street and Trinity and Wadham Colleges will be visited under the guidance of Mr. Jackson, and the other buildings under the guidance of Mr. Edwd. G. Bruton.

CORNISH BENCH-ENDS.

The accompanying sketches are a few examples of the rich store of interesting emblematical designs which are to be found carved on the ancient bench-ends of Cornish churches.

The Kilkhampton designs refer almost entirely to the Passion, those of Launcelles to the Resurrection. In the former, we have (in addition to the figures of bishops) the ladder and thirty pieces of silver, the hand plucking out the hair (in reference probably to the prophecy, "I gave my body to the smiters, and my cheeks to those who plucked out the hair"); next a peculiar kind of Greek cross, the binding cords, scourges, &c.

The Launcelles series are most interesting, and the ability of the artist to bring his meaning so forcibly before us without once introducing a figure is remarkable. The first is evidently the Conquest of Hell by the subject of the second, the Lamb of God; then, without following the order in which they are here placed, we must read the subjects in this way:—Our Lord, typified by his banner of victory, is bursting the grave, whose covering is rolling aside; then come the Three Maries, their visit shown by the three vases of precious unguents; then follow the four appearances, first to the Blessed Mother, typified by the fleur-de-lys and initial ℳ; then to St. Mary Magdalene in the Garden; then to the two disciples at supper at Emmaus (the table has three little loaves for their number); lastly, to St. Thomas, "Reach hither thy hand and thrust it into my side"; the Ascension (No. 5) concludes the forty days' life.

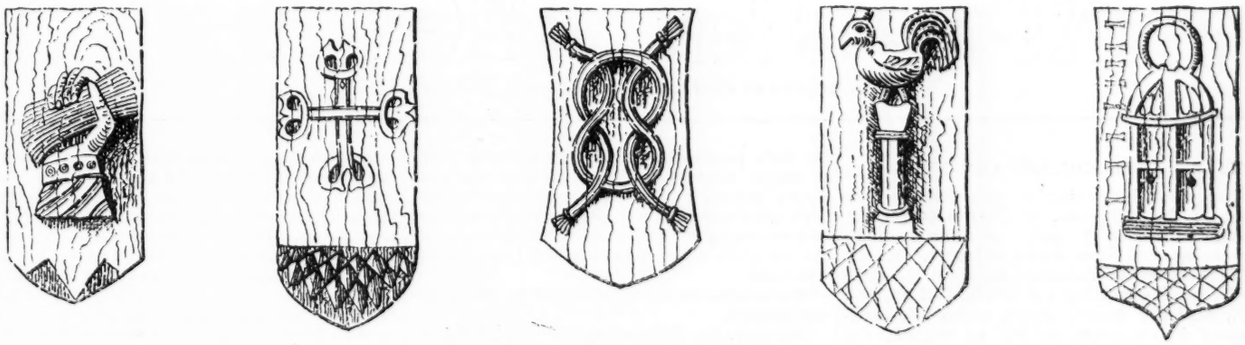
These must be very early examples, for they are fifteenth-century work, and it was not till early in that period that the custom of slating churches was introduced. A. G. L.

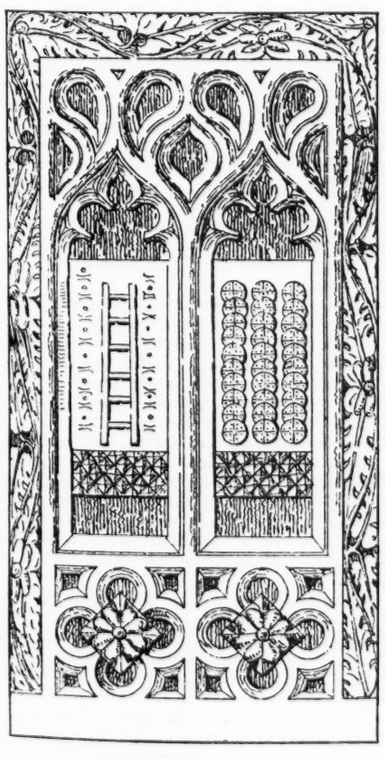
The Briton Assurance Company's Office Buildings in the Strand.—The failure of the Briton Medical and General Life Association, whose affairs are now the subject of investigation in the Law-Courts, has led to the sale of their valuable office buildings in the Strand and Agar-street, which took place last week, at the Auction Mart, under a Chancery order, made by Mr. Justice Kay, Messrs. Debenham, Tewson, & Co. being the auctioneers. The premises were submitted in two lots, the first lot offered consisting of the leasehold property in the Strand, at the corner of Agar-street, covering an area of upwards of 2,100 square feet. The premises were stated to be held for a term expiring in 1904, at a rental of 800*l*. a year, and were offered with immediate possession. The particulars stated that a few years ago a large outlay was made by the Association on the premises, and that they were now well adapted either for an insurance company, a club, or other public institution. Mr. Tewson, the auctioneer, in submitting the property, said its situation made it one of the most valuable at the West-end for commercial purposes. It was sold for 4,500*l*. Two houses in Agar-street, adjoining, were next offered. They are held for a term expiring in 1905, at the annual rent of 90*l*., and let by under-leases at rents amounting to 390*l*. per annum. They were sold at 2,800*l*.

Proposed Tunnel between Sweden and Denmark.—We learn that Mr. Alexander Rothe, an engineer formerly engaged at the Panama Canal Works, has submitted to the Danish and Swedish Governments plans for a railway tunnel under the Sound, between Copenhagen and Malmö, in Sweden. The tunnel is to have a total length of 7½ miles, 2 miles between Amager and the small island of Saltholm, and 5½ miles between Saltholm and Malmö. The ground to be worked is stated to much resemble that in the English Channel between Dover and Calais, and to offer no difficulty in the execution of the work. The cost of construction is calculated at about 1,200,000*l*. The Swedish Government is said to take a great interest in the scheme, while that of Denmark at present is more reserved. Mr. Rothe entertains sanguine hopes of a successful result of the negotiations. The tunnel would be of the greatest importance for the future commercial relations between the Scandinavian peninsula and the rest of Europe if followed by further tunnelling work; for, if, after the greater work was completed, tunnels were made under the Great and Little Belts, through railway communication with the Continent would be complete.—*Iron*.

Launcelles.

Kilkhampton.



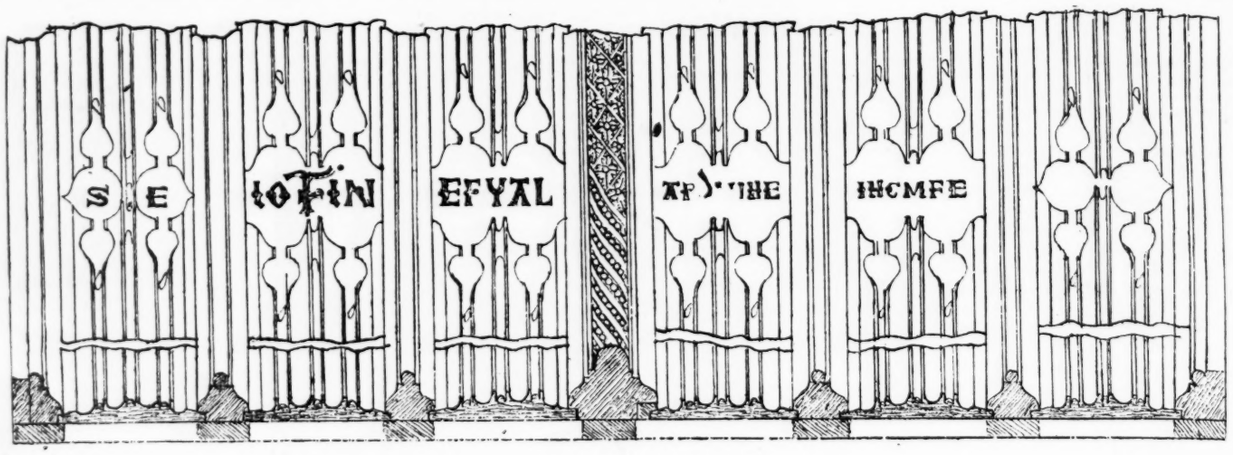


Kilkhampton.

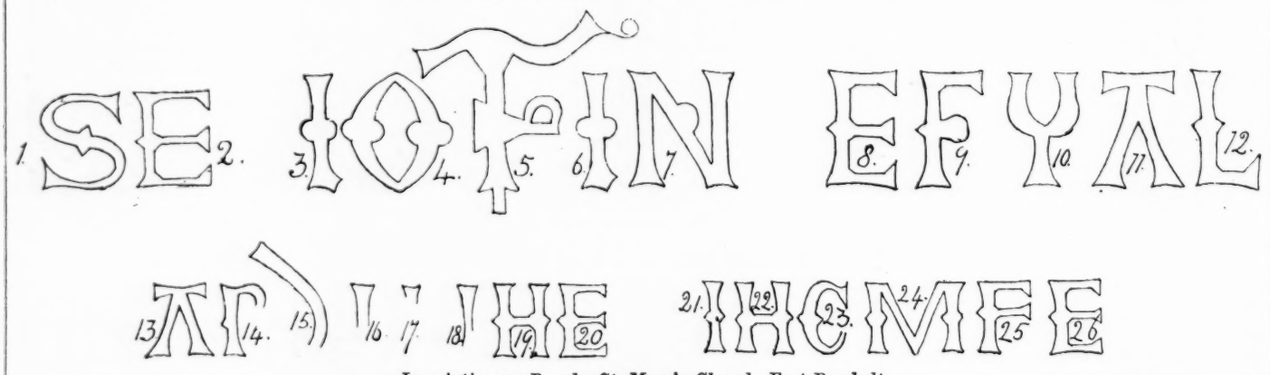
Morwenstow.

Kilkhampton.

CORNISH BENCH-ENDS.—Sketched by Mr. A. G. Langdon.



Panels, St. Mary's Church, East Bergholt.



Inscription on Panels, St. Mary's Church, East Bergholt.

ESSEX ARCHÆOLOGICAL SOCIETY.

The annual meeting of this Society was held on the 12th inst., at Ingatestone, visits being subsequently paid to Margaretting, Fryerning, and other places adjacent. Mr. G. Alan Lowndes, the President, occupied the chair at the opening meeting, and Mr. H.W. King, hon. sec., read the annual report, which was satisfactory in character so far as regards the position of the society.

The Chairman, in moving the adoption of the report, referred to the death of Miss Katherine Fry, of Plashet, who had, he said, as stated in the report, taken great interest in the work of the society since its formation. With regard to the position of the society, he thought that at this time they were not wanting money so much as able contributors to assist. He did not know what they would do without their able friend, the hon. sec. Every one who read the *Journal* would see how much they were indebted to him. He wished they could persuade some younger members of the society to take more interest in it. There was a great deal to learn in the county of Essex,—there was not a single parish in which they could not pick up something. That day they would see the monuments to the oldest family in the county, the family of Petre. They would also see one or two specimens of work almost peculiar to the county of Essex. He was alluding to the brick towers of Ingatestone and Fryerning Churches, which, he believed, were the finest in the county. They would also see some timber towers.

Mr. E. Durrant seconded the motion, but thought that a meeting of the society once a year was not sufficient. He believed that if meetings could be held oftener, especially in the large towns, they would be productive of much good.

The resolution was carried.

The Rev. H. T. Armfield proposed, "That the thanks of this meeting be given to the president, vice-presidents, council, and officers for their services during the year, and that they be re-elected, with the addition of the Rev. H. L. Elliot, to supply a vacancy."

The Rev. W. Gibbens seconded the motion, which was carried unanimously.

The Chairman responded, and moved a cordial vote of thanks to Lord Petre and Mr. Coverdale for their permission to visit Ingatestone Hall, to Major Arkwright for permission to visit Thoby Priory, to the clergy who had opened their churches for the inspection of the society, and especially to the Rector of Ingatestone for the use of the school-room in which that meeting was held.

The motion, on being seconded by Mr. King, was carried.

The Rev. Dr. Hill proposed a vote of thanks to the Mayor of Colchester (Mr. Henry Laver) and Mr. George Joscelyne for auditing the accounts of the society.

Mr. Chancellor seconded the motion. In alluding to remarks which had been made in reference to the laying down of tombstones in churchyards, he said that the matter of churchyards had excited a good deal of attention in many places. His own opinion was that nothing looked much worse than tombstones lying about in all directions. He thought that many tombstones were better preserved by being laid flat. He was about to bring out a work of the whole or nearly the whole of the sculptural monuments of Essex previously to 1700. When he commenced the work he thought that 100 sheets of drawing would cover the whole subject, but he had now got to 140, and seemed to have almost as much to do yet. Some of them were of immense interest. He had found tombs of different members of the same family scattered all over the county, and when he had got them all together he had really compiled a little family history. It was very interesting, too, to study the different attitudes in which the figures were placed on the monuments. They could be traced from the devout position of the Crusaders to the leisurely way in which the statues were placed on the tombs in the times of the Stuarts. Some of the works were very beautiful, and there could be no doubt that at one period, especially from about 1600 to 1650, there must have been a factory almost of these tombs. They appeared to be all designed by one man.

The resolution was carried.

The Honorary Secretary read a memorandum drawn up by a committee appointed by the Council of the Society of Antiquaries as to the importance of the preservation of court rolls and other manorial documents. The memorandum stated that the vast amount of light which the ancient court rolls and other deeds appertaining to the numerous manors in this country threw upon the habits and civilisation, and the legal and social condition of its inhabitants, rendered them of great historical interest and importance. In questions of genealogy their value was self-evident, but in tracing out the development and gradual growth of those institutions under which this country had so long flourished, the aid that they might afford to the student could hardly be over-estimated. Having mentioned that many of the rolls had been destroyed, and that others were liable to heedless destruction, the memorandum went on to say that the Society of Antiquaries was anxious that steps should be taken for the preservation of those remaining, and was confident that if the attention of lords and stewards of manors were called to the historical value of such documents they would readily assist in protecting them from injury, either by despositing them in some public repository, or preserving them with their other muniments.

The Chairman announced that it was proposed to hold next year's annual meeting at Dunmow, where they last met about twenty years ago.

The company then visited Ingatestone Church, where Mr. Chancellor read a paper describing the most interesting features of the building and the monuments. In the construction of the brick tower, which is the finest of its kind in the county, it is said that half a million of bricks were used. Inside the church the memorials to the Petre family were examined.

A move was afterwards made to Ingatestone Hall, where, under the guidance of Mr. Coverdale, jun., the most interesting parts of the building and premises were visited. The hall was formerly the seat of the Petre family until they removed to Thorndon Hall, near Brentwood.

After luncheon at the Spread Eagle Hotel, the company left in brakes to visit the churches of Margaretting, Fryerning, and Blackmore, Thoby Prior (the residence of Major Arkwright), and "Jericho," Blackmore (the residence of Col. Disney).

The party afterwards returned to Ingatestone, where they separated.

Queen's School, Kew.—It has been decided to rebuild the Queen's School at Kew, and Mr. Edwin Dolby is the appointed architect.

THE WEST DOOR OF ST. MARY'S CHURCH, EAST BERGHOLT, SUFFOLK.

SIR,—The enclosed tracing of an excellent specimen of oak doors, ornamented with drapery panels, has been put into my hands for restoration. After carefully removing the paint and dirt in the intervening space between the upper and lower ends of the carved drapery, I have been able to trace the letters as shown in the tracing, and which were originally filled in with a black cement. I should esteem it a great favour if you, or some of your numerous correspondents, could furnish me with a clue to their meaning, so that I can insure their perfect restoration. In five panels, numbering by succession from 1 to 26 and from left to right, they are fairly perfect up to 13; No. 14 may be B, P, or R; 15 is probably D; the heads and part of the down strokes of 16, 17, and 18 are faintly visible, these strokes may comprise two rather than three letters; 20, 21, and 22 are perfect; 23 may be C, G, or S; 24, 25, and 26 are perfect; no letters are visible on the sixth or last panel. The north doors are of the same character, only the upper and lower panels are divided with a moulded transome. I enclose tracing of letters, full size.

THOMAS STOPHER, Wood Carver.

Ipswich.

"LIGHT RAILWAYS."

SIR,—In reply to "C.E.'s" inquiry in your issue of the 14th inst. [p. 252], I beg to say, as contractor, I have carried out upwards of fifty miles of light railways, under Mr. Lewis, of 43, Dame-street, Dublin, who would gladly give any information sought for. THOMAS I. DIXON.

A WARNING.

SIR,—During the present month I have had four robberies. First, a hand-truck, stolen from a house in Bloomsbury, and found a week after, with name erased. Second, brushes and tools from Belsize Park; a ladder was brought from some other builder's works near, and by it the thief gained an entry through the back window. Third, a sixty-round ladder from Marylebone-road; evidently, two or three thieves must have been implicated in this. Fourth, some brushes from Regent's Park. Oddly enough, on giving notice to the Police Inspector, and telling him of my losses, he said he had a sixty-round ladder which he wanted an owner for in the yard.

I do not know whether the thieves have selected me only for their favour, but I should advise my brother builders to be on the alert.

STANLEY G. BIRD.

SIR JOHN SOANE'S MUSEUM.

SIR,—In answer to a letter which appeared in your last issue [p. 252] from "A Would-be Reader," and in which it is stated that this Museum is "practically useless, as it is closed for nearly ten months in the year," I beg to inform him that the public season begins on the 1st of February and continues till the end of August, and that cards for private days and for students can be obtained from the curator at the Museum.

This information is frequently advertised, and it might have been seen on the front page of the *Builder* of the 7th inst.

JAMES W. WILD.

PROVINCIAL NEWS.

Leicester.—The committee charged with the erection of the new Liberal Club-house have held a competition among the liberal architects of Leicester. The plans were referred to Mr. E. R. Robson, F.S.A., of London, who selected that of Mr. E. Burgess, of Leicester and London, as the best. Mr. Burgess has accordingly been appointed architect to the new building.

Melbury (Dorset).—The Earl of Ilchester, the Lord Lieutenant of Dorset, has made some considerable additions to the fine old mansion at Melbury. An entirely new wing has been built at right angles to and on the west of the old house, running north and south, and terminating at the southern end with a tower 100 ft. high. A large gateway forms the entrance to a quadrangle, and in the side wall is the main entrance to the house, formed by a deeply-recessed doorway, richly panelled and carved. The roof is vaulted in two bays, with deeply-moulded ribs with carved bosses and heraldic shields at the intersections. There is a room over the archway, approached by an octagonal turret with an oriel window over the centre of the front arch, something similar in design to those at Montacute Priory Gatehouse and at Ford Abbey, which were both the work of Thomas Chard, who was Prior of Montacute and Abbot of Ford. The fine old tower at Melbury, which is nearly all that remains of the original mansion, was built in the days of Thomas Chard,—the period of the best Perpendicular work. The new work has been designed to harmonise, as far as possible, with this. The whole of the dressings, and the whole of the walls are faced with Ham Hill stone, which has been supplied and fixed complete by Messrs. Charles Trask & Sons. The brickwork and rough walling, as well as the woodwork, &c., have been executed by Lord Ilchester's own workmen, under the direction of Mr. George Buxton, the clerk of works. The architects are Messrs. Devey & Williams. A good deal of work remains to be done to the interior. The Earl of Ilchester has given a splendid entertainment to the workmen who have been employed on the building so far. The men, numbering between forty and fifty, were invited to a supper, which will be long remembered by them as being the most hospitable they had ever seen. Mr. F. Nichols, manager to Messrs. Trask & Sons, was requested to take the chair, Mr. Buxton being vice-chairman. The Earl of Ilchester was from home, but after supper the Countess and Mr. Wells, the estate agent, were present. The healths of the Earl and Countess and their family were proposed and responded to. Mr. Wells proposed in complimentary terms the health of Messrs. Trask & Sons, and the Countess addressed the men, saying how pleased she was at their conduct during the two years the works had been in progress, and how thankful she was that no accident had occurred.

CHURCH-BUILDING NEWS.

Filey.—The interesting old church of Filey was re-opened on August 5th. The building is mainly Early Pointed. In the south transept are sedilia and piscina, marking the site of an altar of importance. New aisle windows, north porch, oak roofs to nave and transepts, east window, oak benches, &c., have been added. The chancel remains to be fitted and re-roofed. The walls have been denuded of all their plaster, and look rough. 4,100*l.* have been spent. The architect is Mr. Swindon Barber, of Halifax, and the contractor Mr. Thompson, of Peterborough.

Hebburn. — The new Church of St. John, which has been in course of formation and construction during this summer, has now reached in some parts of its masonry a considerable height. The plan consists of a long nave and chancel, with a vestry and heating-chamber, with fuel-house opening out of the north side, and a narthex baptistery and entrance-porch annexed to the west end on the south side. Massive buttresses project at intervals, and alternating with them are double-light windows in the nave, and triple-light windows in the chancel, the heads of which are filled with tracery. In the interior there will be sittings for 352 adults in the nave and narthex, and 120 children; and in the chancel there will be stalls and seats to accommodate 96 persons, forming a total of 568. The architect is Mr. F. R. Wilson, and the contractor Mr. John Monro. Mr. M. Temple Wilson is acting as resident architect.

Lillingstone Dayrell (Bucks). — A new reredos, the gift of Mrs. Robarts, of Tile House, near Buckingham, has just been set up in this church. It consists of an arcading of five arches, with cornice over, and altar-shelf of red Devonshire marble, the whole being flanked with buttresses. The detail, of Transitional character, has been made to correspond as far as possible with the early work in the chancel. There is a fine cross in the centre, of Sicilian marble, on a ground of Rosso Antico. This stands under a trefoil-headed arch of selected Derbyshire alabaster. There is much dog-tooth moulding in the cornice and elsewhere. The remaining material of Caen stone; the whole being the work of Mr. Harry Hems, of Exeter. New stalls are also in progress for the church; these as well as the reredos are from the designs of Mr. E. Swinfen Harris, and are being carefully supervised by him. They are the work of Mr. W. Watson, of Stony Stratford.

Porth.—On Thursday afternoon, the 5th inst., the foundation-stone of a new church at Porth, Rhondda Valley, was laid by Miss Davies, Glynrhondda House, in the presence of a large concourse of people. The site of the new building, which is on the estate of Major Leigh, has been given gratis, and a handsome structure, to accommodate 350 persons, has been designed by Mr. E. M. Bruce Vaughan, architect, Cardiff, and is being erected, at a cost of about 1,100*l.*, by Messrs. Thomas & Morgan, contractors.

Shrewsbury. — The *Shrewsbury Chronicle* understands that specifications for the rebuilding of the choir of Shrewsbury Abbey Church, towards which an anonymous donor recently contributed the munificent sum of 10,000*l.*, are now in the hands of the building trade, is to be at once commenced. The work to be done, the designs of which have been prepared by Mr. J. L. Pearson, R.A., comprises the chancel, crossing, and one bay each of north and south transepts, and north and south vestries. The area proposed to be covered is about 76 ft. by 70 ft. out-to-out of walls. The apices of the main gables will be 78 ft. above the nave floor, and the top of the main walls will be 58 ft. from the same floor. The chancel roof will be arched and groined, and there will be comparatively little timber used in the structure, which will be in the main solid masonry of either Shelvoke, red and white (mottled) stone, or red Harmer Hill stone, both internally and externally. The tenders were to be opened on the 27th ult. It is a proviso in the specification that all coins, antiquities, fossils, and objects of value found in the necessary excavations are not to be considered the property of the contractor or his workmen, but are to be placed in such a place as may be directed.

Timsbury.—On the 29th ult. the parish church of Timsbury, dedicated to St. Mary, was reopened by the Bishop of Bath and Wells, after being re-seated and the interior thoroughly restored. Although the present structure is of modern date, the church was filled with the old-fashioned pews, and had also a north, west, and south gallery. The pews have been replaced by open pitch-pine seats, and the north and south galleries removed; the west gallery remains, having been re-seated, and a new front of pitch-pine panelled with oak taken from the old floor of the nave; the walls have also been wainscoted with the same. The architect was Mr. Spencer, of Timsbury, and the contractor Mr. Pollard, of Bridgwater. The font has been removed from the centre of the nave to near the south door; it has been re-cut and carved with water-lilies round the bowl, while round the top are the words "One Lord, one Faith, one Baptism." Round the base a pavement of encaustic tiles, specially designed for the purpose, has been laid. The windows have been filled with cathedral glass.

DISSENTING CHURCH-BUILDING NEWS.

Brighton. — The enlargement of Queen's-square Baptist Chapel having been completed, the building was re-opened for public worship on the 8th inst. The work of alteration has occupied three months, during which time the chapel congregation met for worship at the Royal Pavilion, where the services were well attended. The style of the building has not been altered as to the exterior; what has been done has been to increase the accommodation to nearly double its former extent. To effect this the wall that used to separate the class-room from the chapel has been removed and the class-room taken in, giving accommodation for a hundred extra persons. The gallery above has been enlarged, and affords accommodation for now an additional two hundred persons. The interior has also been modernised, the chapel now being light, airy, and commodious. The roof has been raised and left open, showing the open tie-beams instead of being ceiled flat, as in the old building. A better system of ventilation has been introduced, and two coloured windows have been placed at the north end, the general effect of the alteration having been to produce a substantial improvement. The cost of these building operations is said to be 1,000*l.*

Tiverton.—On the 30th ult. the foundation-stone of a new Bible Christian Chapel was laid at Tiverton. The cost of the building will be about 800*l.* The *Western Times* says that "it is proposed to finish the exterior of the chapel according to the modern type of chapel architecture, while the front of the galleries will be set off by an ornamental palisade with book-rests, &c." Mr. W. Collard and Mr. S. Manning are entrusted with the contract. Mr. S. Deering drew the plans of the new building, and Mr. W. Barrons acts as surveyor.

The Student's Column.

STONE QUARRIES.—VIII.

ENGLISH HORNBLENDIC GRANITES.

THE principal districts in which hornblendic granites occur in England are at Shap Fell, in Westmoreland, and in the igneous mass of Leicestershire.

The *Shap Quarries* are situated at a considerable elevation above the works where the granite is polished, &c., and the two are connected by a railway, the gradients of which are about 1 in 25.

In recent geological times, glacial action has been at work in the district, and blocks of stone from this mass of rock have been carried away great distances from it. As might be expected, the adjacent moors are strewn with them, but chiefly to the east and south east. Blocks of shap granite have been found at irregular intervals all the way between the quarries and the east coast, some sixty miles distant at the nearest point. In a south-easterly direction they have been carried further still, and there is one about 14 ft. by 12 ft. half embedded in the ground at Seaham Station two miles from Scarborough,—a distance of more than ninety miles from the quarries.

The stone itself, may be described as a porphyritic hornblendic granite. It varies in colour from light grey, dark grey, golden grey, pink, full red, and deep purple, but for the purposes of commerce there are only two varieties, known as dark and light shap. The base of the rock is fine, the dark kind having small granules of quartz, clear and transparent; the felspars are mostly deep red, but pink and almost white crystals are seen here and there. Mica occurs in minute black flakes, whilst the, comparatively speaking, little hornblende present is just sufficient to cause the rock to be removed from the ordinary granites. Iron pyrites is also present in small quantities. The ground mass of the light kind is slightly coarser than that of the dark, yet it may still be called fine-grained, and it owes its light colour to the fact that the felspars, instead of being dark red, are a light yellowish green, sometimes almost white, and occasionally light pink. Otherwise the two rocks are very similar in appearance. The large orthoclase felspars that cause the rock to become porphyritic are salmon-coloured, and, as compared with those in Cornish granites, are remarkably uniform in size, being usually about an inch in length. They are twinned, and do not appear to lie in any particular position, except for short distances, so that the planes of the crystals, if produced, would intersect one another at various angles. The stone is capable of taking a high polish.

The face of the principal quarry is upwards of 130 ft. in height, and detached blocks, weighing from 1,500 to 2,000 tons, have been blasted; but for practical purposes, blocks of more than 20 tons are seldom required.

We will now give a short account of the method of quarrying, and the machinery used in these quarries. It must be understood, however, that we do not intend to convey to the student the idea that the workings and machinery are necessarily better than in other large quarries in the United Kingdom, or that all the appliances are peculiar to the quarries under consideration. All large quarries use somewhat similar machinery to each other, which is modified according to the magnitude of the workings, and the adoption or otherwise of the latest improvements.

In quarrying Shap granite, holes are drilled having a diameter of from 2 in. to 3 in., and reaching occasionally between 30 ft. and 40 ft. in depth, in which charges of gelatine or gunpowder are placed. The former is best adapted for wet weather. Dynamite is found to be practically useless on account of its shattering propensities. When a large block is brought down on the floor of the quarry, it is usually split with wedges in the first place, as described p. 183, *ante*. Then steam boring drills are set to work to cut the stone into the size ultimately required. By means of these drills, which will pierce some 130 ft. of granite per day, a great saving is effected, as the largest blocks can be cut to a nicety and great waste obviated. The size of the holes made for this purpose is usually 1 in., and they are placed 5 in. or 6 in. apart. A portable engine supplies these drills with steam, which is conveyed in piping in drains to various points in the quarry. This engine also drives a granite-crushing machine and its numerous appliances: the crushed material is used for concrete work.

There are two steam cranes, 20 tons and 15 tons respectively, to assist in the manipulation of large blocks of granite, together with a gantree with crane, the latter being placed over the masons' sheds.

The granite intended to be used for engineering purposes, such as in docks, bridges, &c., is worked up in the quarries, and loaded into railway trucks, being taken to the main line by a locomotive.

The cut blocks for architectural and monumental purposes are conveyed to the polishing works, where they are first masoned, and the smoothest possible face put on before being placed in the polishing-mills. In front of the masons' sheds, which are some 100 yards in length, a steam crane travels for the purpose of turning, fitting, and loading the granite. There is also a large gantree for stocking purposes, and for the working of exceptionally heavy blocks.

We now come to the granite turning-lathe, otherwise known as the "steam-mason," which is capable of doing the work of fifteen men, and dealing with columns up to 16 ft. or 18 ft. in length and up to 2 ft. 8 in. in diameter. The corners are roughly scabbled off a squarely cut piece of granite before being put into the lathe. The cutters of the lathe consist of two circular cast steel discs, which are on opposite sides, one acting as a counterpoise to the other, as well as doubling the amount of out-turn. These cutters have a tapered hole bored in the centre, through which is passed a spindle with boss. This in turn is placed in the rest, when the boss on the spindle is tightly screwed up against the face (or rather, in the tapered hole) of the cutter. The cutter and spindle revolve; the rotary motion being given by the column or block of granite which is turned by steam-power. There are other granite turning-lathes in the works, which are smaller, being adapted for vases, balusters, urns, &c.

Let us now consider the polishing process. When a column comes from the turning-lathe it is placed in an ordinary lathe, and is so fixed as to revolve. Cast-metal planes are then placed upon it, and sand and water applied, which puts on a fairly smooth surface, then emery and water, which imparts a still finer surface. At this stage the plane is covered with thick felt, and the polish is brought out by the application of putty-powder. This process applies to the polishing throughout.

The lathes are of various sizes, being adapted for polishing urns, fountain-basins, and columns, from 2 in. up to 8 ft. in diameter. The Ross of Mull granite columns at Blackfriars Bridge, which are 8 ft. in diameter, is one of the productions of these lathes.

In other parts of the works there are machines for polishing flat and moulded surfaces. When a flat surface of some 50 ft. or 60 ft. super. has to be polished, the various blocks are placed on what is usually called a "wagon." The stones are all packed so as to make a perfectly level surface, over which large flat rings revolve at a rapid rate. An even polish is given all over by the wagon travelling backwards and forwards, like the bed of a planing-machine.

A different principle is adopted in another part of the works, machines called "verticals" being used, but the amount of polishing done is not so large as with the "wagon." Here the granite is stationary. The rings revolve as in the other machines, but a piston-like motion, combined with a swivel-joint, enable the workmen to direct the polishers over any part of the surface.

The machines by which mouldings are polished are known as "sliders." In the first place the mould is cut to drawing, by a mason, then plaster of Paris is run on the mould, and an accurate impression thus obtained. From this pattern a metal casting is made. The granite is then laid on a frame, or on the ground, the casting is attached to a long wrought-iron arm fixed to a pin on a large face plate, and the machinery set in motion. The arm travels to and fro, and, to prevent loss of emery, &c., the moulds are roughly encased in a wooden frame and the joints stopped with plaster of Paris.

Circular door and window heads can be polished in these machines as well as straight mouldings. Where anything very elaborate has to be executed it is done by hand, and, as we have before had occasion to remark, the price of the material is considerably augmented.

Shap granite has been used in various parts of the country, and nearly all architects are well acquainted with its artistic appearance. The student will find good examples of the stone in the posts round St. Paul's Cathedral and the Temple Bar Memorial.

SIR,—In your issue of the 7th inst., under the heading "The Student's Column," remarks are made apparently upon this Company's quarries, which do them grave injustice.

The upheaval of granite, known as Kit Hill, is distinct from the rest of the granite in its neighbourhood, and contains no other quarries than those worked by this Company.

The rock has been satisfactorily tested, and has been used, among others, by the Trinity House, to whose engineer it has given perfect satisfaction. It is even and fine in grain, of good colour, and thoroughly reliable in quality, and has been declared by one of the highest authorities on granite to be "well adapted for any description of work, whether tool-dressed or polished." It is quarried in very large blocks, some hundreds of tons in weight. Your contributor has associated these quarries with others in the neighbourhood, which are not on Kit Hill, and has spoken of them all under the name of Kit Hill. This conveys an erroneous impression. Your contributor has not applied to us in any way for information, and we dispute entirely his facts, and the conclusion at which he arrives. I may add that we are prepared to place samples and testimonials in your hands, which will amply prove our assertions.

W. J. CHALK, Assoc. M. Inst. C.E.,
Engineer and Manager to the Kit Hill Granite Company (Limited).

10, *Delahay-street, S.W.*, Aug. 18, 1886.

SIR,—Referring to your issue of 7th inst., I have not sent out any circular giving any account of prospective work from the Gunnislake Granite Quarries proper, and did not understand your passing remark to refer to them in this respect, or as to uncertain quality and prevalence of joints.

You do not appear to have inspected my properties. The Freehold on the main coach road is in the village of Gunnislake, above and close to the Tamar, and is thoroughly developed, having been worked since 1808, and to the depth of 150 ft. in the side of the hill. I enclose test and analysis of the grey granite, and claim that it is the whitest, purest, and strongest known quality.

The Leasehold is adjacent, behind the village of Gunnislake, and has several quarries opened, all yielding silver grey granite, similar to that per test and analysis.

Blocks of any sizes can be quarried, and working can always be effected continuously.

I invite inspection of the granites at the different quarries in support of above; or, in case you do not do so, in order that you may judge for yourself, I will send you six samples.

EDWARD STORY.

Books.

A Treatise on Marine Engines and Steam Vessels. By ROBERT MURRAY, Principal Officer to the Board of Trade for the East Coast of Scotland. Eighth Edition, revised by the Author and by GEORGE CARLISLE, Senior Surveyor to the Board of Trade at Liverpool. London: Crosby Lockwood & Co. 1886.

THIS book is a very early friend of ours, and retains in its present form many of its primitive characteristics. Personally we are obliged to the joint authors for not disturbing too rudely our early reminiscences. There are still the same familiar pictures:—"Fig. 1. Side-lever Engine." "Fig. 2. Direct-acting Engine, as constructed by Messrs. Seaward, Capel, & Co.,' together with such venerated names as Boulton & Watt, Fairbairn, Forrester, Penn, and many other fragments of ancient history. If we were to judge by this section of the work we might suppose the paddle-wheel to be still the most general type of propeller for steam vessels, although we are informed that there is such an appliance as the screw, for have we not "Fig. 13. Inverted Direct-acting Screw Engine," after the dozen cuts of paddle-engines have been disposed of?

If we turn from the illustrations to the text of the chapter on "varieties of form," which is said to treat "of the marine engine of the present day, as it is found in vessels of the Royal Navy and merchant service," we find the description carried down quite to the present time, there being no fewer than nine lines at the end of the chapter devoted to the three-cylinder compound engine. The student is also told that "in the great majority of cases the screw is now driven direct, more especially

in the largest class of steamships." We should as soon expect a writer on modern fire-arms to inform us that bows and arrows are fast becoming obsolete in the armies of Europe.

The fact is, this part of the book bears too much evidence of the antiquity of the original edition, and, in order to fulfil the promise of the preface, should have been entirely rewritten, whilst the obsolete illustrations should have been either omitted or largely supplemented by those of modern types of engines.

A consideration of the "details of various parts," which only occupies sixteen pages, and is, therefore, not very exhaustive, carries us on to the principles of expansion of steam, and after that to the use of the indicator. Here we find the same fault, for no mention is made of the Richards indicator, that described being of the original and obsolete type, which we should think is rarely seen now excepting in museums. We make bold to say, although neither scale, steam pressure, nor revolutions are stated, that a set of cards from the *Umbria's* engines, which are reproduced, were not taken with a Watt indicator.

The part of the book devoted to steam boilers is more satisfactory, although no mention is here made of corrugated furnaces, the most important invention of modern times in connexion with steam generation; and the illustration described as a "locomotive boiler" (fig. 20) really represents a very different type. It has two cylindrical furnaces, and is, in fact, the well-known gun-boat boiler of the Navy. The space occupied by the consideration of the "efficiency of steam vessels" might well have been devoted to questions more germane to the titles of the book.

From what has been said it will be gathered that the work is by no means perfect. There is doubtless a good deal of information for the novice scattered throughout its pages; but the foundation upon which the work is built is so antiquated that it is next to useless as a means of practical instruction in marine engineering. The appendices, which occupy nearly half the book, form the most valuable part of the work. They contain details of various steamers, Board of Trade regulations, tenders and specifications for navy and mercantile engines, and an Admiralty Committee's report on marine boilers. There is also a glossary of terms, with their equivalents in French, German, Italian, and Spanish, which is of value.

Euphronios: Eine Studie zur Geschichte der griechischen Malerei. Von Wilhelm Klein. Wien: Carl Gerold (Zweite umgearbeitete Auflage, mit sechsig Abbildungem im text).

When the first edition of Dr. Klein's "Essay towards the History of Greek Vase Painting" appeared, seven years ago, it created a great stir among archæologists,—it was a book that deserved, if any, the title of "epoch-making." The study of Greek vase-paintings became, from the date of its issue onwards, matter for serious science. But unhappily the book was heavy and laborious reading,—it needed for its understanding constant reference to a series of plates (*Vorlegeblätter*) issued at Vienna for purposes of University lecturing, and possessed in England by only a few specialists. To make matters worse, these plates fell speedily out of print. It thus happened that a book of rare value, that should have been readily intelligible to the educated public, became a closed secret to all but a few of the initiated. It had, however, in Germany an immense success, and happily for us in England a new edition has been called for. Students of vase-painting will readily see that in the new edition there are important modifications of opinion, but our object is to call attention to one new feature in the book, which makes it generally intelligible. It is now profusely illustrated. Not only are the nine vases of Euphronios, formerly so difficult of access, and on which the meaning of the whole argument hinges, represented by nine very fair woodcut reproductions, but there are upwards of fifty subordinate illustrations, which render the text comparatively easy reading. We hope that this new edition will reach to wider circles than could possibly be attained to by the old one.

Shadwell Hospital Competition.—We are asked to state that the set of plans marked "Thought," and placed second in the competition, are by Mr. Arthur Ardron.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

11,015, Improvements in Grates. E. Taylor.

An L-shaped grate is made of round or flat bars, the round bars being L-shaped and double at one end, so as to form the bottom part double. Two of these round bars are also bent to form the feet. The grate may be fixed in any ordinary fire-grate. In another form, a semicircular plate is used; this plate is perforated at its lower end, and is hung on the top part of the grate by a hook, and thus is suspended in front of the fire-bars. Or, a grid or grate is used to save the breaking up of the fire when cooking, thus economising fuel.

11,133, Ventilation of Street Drains. H. P. Dawson.

Instead of ventilating the street drains by means of manholes or other openings, which allow the stench and foul gases to escape into the street, this invention proposes to carry the gases up the inside of pillars or shafts before permitting them to escape into the atmosphere. For this purpose the posts of the gas-lamps are utilised, and the gases led up by pipes from the drains to openings just under the lantern. The manholes are of course covered with solid lids, and every other opening for ventilation is sealed, excepting the lamp-holes, whence the stench escapes over the heads of the passers-by.

6,663, Door Springs and Checks. J. J. Purnell.

This is a modification of the now well-known hydraulic door-check, by which a door may be opened and closed with facility. The advantages claimed by this patent (that a smoother, more easy, and efficient motion is obtained) are gained by the use of an oscillating instead of a fixed cylinder. The reservoir, filled with oil or other fluid, is widened at one end to allow for this movement. Another point is, that by the very simple device of giving to a certain portion of the crank a flat surface, the absolute closing of the door is ensured, and the tendency to yield either to the right or to the left is avoided, and the ingress and egress of the air prevented. The apparatus is preferably placed so that no part of it will project beyond the inner edge of the door, thus rendering it unnecessary to cut into, and so weaken the door-post.

6,365, Preventing Noise in Closing Doors. G. B. Thornton.

This relates to a special provision for preventing the noise occasioned by the jarring of the catch of the lock coming against the striking-plate. A block or cushion of rubber is inserted in the framing of the door, suitably formed to receive the stroke of the catch before it enters the slot in the plate. The indiarubber yields sufficiently to allow the catch to enter and pass through the slot in the plate and into the cavity of the door-frame without noise. The cushion is either bevelled off to facilitate the passing of the catch over it; or a small roller of indiarubber may be fitted in the plate.

NEW APPLICATIONS FOR PATENTS.

August 6.—10,063, B. and W. Weale, Lever Plunger Flushing Cistern for Water-closets, &c.—10,071, J. Harnett, Chimney-top.—10,092, F. Stevens, Mechanical Electrical Indicator.

August 7.—10,127, E. Schroder and H. Perner, Non-oxidising Coating for Wood. &c.—10,128, J. Daglish, Kilns for Burning Lime, &c.

August 9.—10,139, C. Wharton, Automatic Window-sash Fastener.—10,150, J. De Baere, Preventing Down-draughts in Chimneys.—10,161, G. Redfern, Utilising Heat from Chimneys.—10,167, J. Jeserich, Artificial Asphalte.—10,168, H. Haddan, Door-hinges, &c.

August 10.—10,182, J. and T. Breakell, Decorative Material.—10,199, S. Pratt, Fastening and Alarm for Doors, Shutters, &c.—10,219, P. Smyth, Fittings for Drains, Sewers, Waste-Water Pipes, &c.

August 11.—10,261, J. Broadfoot, Automatic Valves for Ventilating Pipes.—10,262, J. Stapleton, Flushing Tank and Cistern.—10,265. C. Webb, Dry Closet.—10,287, G. Handley and W. Burke, Sawing Stone, Marble, &c.—10,298, F. Lyte, White Pigment.

August 12.—10,323, F. Bosshardt, Splitting, Shaping, or Finishing Building Stones, &c.—10,329, H. Cunningham, Drying Portland Cement, Bricks, Tiles, &c., by Heat.

PROVISIONAL SPECIFICATIONS ACCEPTED.

4,479, G. Inglis, Portable Guard for Persons Painting Windows.—5,391, W. Baldwin, Waste-preventing Syphon Cistern for Flushing Closets, &c.—7,438, E. & E. C. Kerry, Bricks.—8,725, J. Bennett, Pigments.—9,075, A. Williams, Dustbin.—9,225, J. Parlour, Workman's Daily Food Carrier.—9,476, H. Lake, Ventilating.—9,544, W. Blakeney, Shop-window Fittings.—8,452, R. Thompson, Fastenings for Window Sashes.—8,910, J. Law, Feeding Mechanism for Saw Frames.—9,111, H. Buchan, Valve Apparatus for Water-closets.—9,320, W. Bartholomew, Fittings for Baths and Lavatories.—9,481, H. Haddan, Ascertaining Leakage in Water-pipes.—9,551, W. Reid, Hydraulic Cement.—9,577, J. Potts, Construction, Bedding, and Laying Drain or Sewerage Pipes.—9,584, A. Sweet, Ventilators or Windguards.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to opposition for two months.

9,765, J. and J. Heward, Cut Nails.—11,806, W. Timewell, Cement.—12,068, F. Armstrong, Inspection Openings for Drains.—5,921, R. Macan, Sanitary Dustbin.—7,674, H. Mathey, Cement.—7,827, J. Shaw, Cooking Ranges.—8,864, M. Adams, Sewerage and Drainage Works.—8,919, J. Hart, Locks, Latches, &c.—8,975, J. and G. P. Jones, Brick and Quarry Boxes.—12,014, J. Pratt, Gilding Glass.—12,118, G. Garrard, Manufacture of Tiles.—12,251, W. McHaffie, Ventilators and Smoke Cowls.—12,252, A. Drummond, Glazing.—12,634, J. Higginbotham and H. Holland, Window-sash Fasteners.—5.235, W. Jenkins, Treble Ladder.—7,878, S. Harrison, Notched Blocks for Building Walls downwards.—9,050, T. Thornton, Door Check.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

July 27.

By Sedgwick, Son, & Weall.

Watford—6, Carey-place, freehold £190

August 5.

By Sedgwick, Son, & Weall.

Eastcote—Copyhold house, cottages, and 3a. 1r. 0p. 685

By G. B. Smallpeice.

Basingstoke—1, Chestnut-villas, freehold 230
Church-square—Two freehold cottages 230
Church-street—Freehold house and shop 225

August 6.

By Sedgwick, Son, & Weall.

Rickmansworth—Fourteen freehold cottages 950
Two freehold houses and a cottage 950

August 9.

By Marler & Bennett.

Earl's Court—1 and 1a, Portland-cottages, and Portland Lodge, 55 years, ground-rent 25*l.* 1,500
Westbourne-grove—6, Monmouth-road, 33 years, no ground-rent 550

By Furber, Price, & Furber.

Notting Hill—101, 103, and 105, Golborne-road, 80 years, ground-rent 30*l.* 2,810
New Southgate, Station-road—St. Thomas's Cottage, 80 years, ground-rent 10*l.* 560

By J. Hibbard.

Islington—21 and 42, Canterbury-road, 65 years, ground-rent 7*l.* 10s. 590
Stoke Newington—126, Green-lanes, 59 years, ground-rent 10*l.* 750

By Mr. Woods.

Southwark—53 and 55, Summer-street, 814 years, ground-rent 2*l.* 2s. 615

August 10.

By G. Stockings.

Islington—3 and 6, Crowland-terrace, 51 years, ground-rent 9*l.* 690

By Heaps, Son, & Reeve.

Drury-lane—No. 23, freehold 1,660
Stepney—95, Rutland-street, 18 years, ground-rent 3*l.* 95
Hoxton—2 and 3, Bristow-street, 24 years, ground-rent 19*l.* 4s., and Ground-rents of 13*l.* 4s., term 19 years 360
4 to 7, Bristow-street, 25 years, ground-rent 12*l.* 16s. 670
Lambeth—12, Oakley-street, 25 years, ground-rent 21*l.* 5s. 250
Hornsey, Middle-lane—St. John's, 93 years, ground-rent 9*l.* 305
Brixton—9, 10, and 11, Sussex-street, 21 years, ground-rent 6*l.* 300
12, Sussex-street, 21 years, ground-rent 3*l.* 155
49 and 51, Cornwall-road, 74 years, ground-rent 6*l.* 10s. 530
81, Coldharbour-lane, 37 years, ground-rent 3*l.* 3s. 200
Pimlico—48, Alderney-street, 51 years, ground-rent 8*l.* 8s. 505

By Debenham, Tewson, & Co.

Brighton—12, German-place, freehold 880
85, King's-road, and Stabling in rear, freehold ... 11,800
Strand—No. 429, area 2,100 feet, term 18 years, rent 800*l.* 4,500
2 and 3, Agar-street, 19 years, ground-rent 90*l.* 2,700

By Jones, Lang, & Co.

Lewisham—Beacon Lodge, 29 years, ground-rent 20*l.* 750

August 11.

By Maddox & Son.

Aldgate—No. 33, freehold 3,010

By R. J. Collier.

Willesden—The residence Pheasantfield and 15a. 3r. 20p., freehold 16,000

By Green & Son.

Kensal Green—1, 2, and 3, Mary's-place, freehold... 1,210
1, William's place, freehold 475

By Joshua Baker & Co.

Fulham-road—Nos. 564, 566, and 568, freehold 1,275
No. 570, Fulham-road, and Stabling in rear, freehold 580
31a, Claybrook-road, freehold 200
Two plots of freehold land in Claybrook-road..... 125

By G. Pearce & Sons.

Hoxton—The Bridport Arms public-house, 7 years, ground-rent 20*l.* 700
18, Salisbury-street, 7 years, no ground-rent 100
11, Felton-street, 31 years, ground-rent 6*l.* 135
27 to 43 (odd), Harman-street, 56 years, ground-rent 2*l.* 5s. 4,720
Ground-rent of 30*l.* a year, term 56 years..... 530
15 and 17, Northport-street, 49 years, ground-rent 9*l.* 10s. 650
2 and 6, Mintern-street, 44 years, ground-rent 7*l.* 450
Kingsland—35 to 45 (odd), Downham-road, 34 years, ground-rent 14*l.* 1,615
Mildmay Park—67, Queen Margaret's-grove, 64 years, ground-rent 5*l.* 5s. 315

August 12.

By Beadel & Co.

Cowley, near Uxbridge—Cowley Peachey House and 13a. 0r. 20p., freehold	£2,900
The Packet Boat public-house	2,200
Freehold house and three cottages adjoining	550
An enclosure of freehold land, about 5a.	910
Camberwell—Ground-rent of 8*l.*, reversion in 78 years	170
Ground-rent of 60*l.*, reversion in 68 years	1,280
Ground-rent of 13*l.*, reversion in 69 years	275

By P. Matthews.

Bermondsey—81, Spa-road, freehold	710
Pentonville—8, Cumming-street North, 24 years, ground rent 4*l.*	165

By C. C. & T. Moore.

Stepney—15, East Arbour-street, 25 years, ground-rent 3*l.*	250
Canning Town—77 to 83 (odd), Bidder-street, 76 years, ground-rent 15*l.*	250
Bow-road—No. 43, term 16 years, ground-rent 7*l.*	250

By Hands & Jenkinson.

Leytonstone—1 and 2, Grove-terrace, 95 years, ground-rent 8*l.*	180

By Newbon & Harding.

Clerkenwell—17, Sekforde-street, 27 years, ground-rent 6*l.*	465
Holloway—11, 13, and 15, Alexander-road, 72 years, ground-rent 18*l.*	840
4 to 28 (even), Landseer-road, 72 years, ground-rent 83*l.* 2*s.*	3,165
3, Kingsdown-road, 72 years, ground-rent 7*l.*	315
Upper Norwood, Hamlet-road—Lansdown Lodge, 65 years, ground-rent 5*l.*	560

By F. J. Bisley.

Rotherhithe—41, 43, and 45, Silwood-street, 70 years, ground-rent 9*l.*	590
22 to 28 (even), Silverlock-street, 70 years, ground-rent 21*l.*	840
9 to 17 (odd), Westlake-road, 70 years, ground-rent 2*l.* 10*s.*	1,000

Miscellanea.

Bedford Memorial Bridge in Glentilt.—A bridge has just been erected across the Tarff on the way between Blair Athole and Braemar, immediately above the old ford, where it may be remembered that Mr. Bedford, captain of St. Paul's School, London, lost his life on the 25th of August, 1879. The proposal to erect a bridge was started by the friends of Mr. Bedford, but they were unable to raise sufficient funds to carry out the proposal, and after a lapse of about five years the Scottish Right of Way Society came forward and arranged with the Bedford Memorial Committee to have a bridge erected, promising to add to the subscriptions such amount as would be required for the completion of the undertaking, and a bridge has now been completed. It is a suspension bridge, having a span of 40 ft., and is supported on wire cables that are strained over malleable iron piers which are firmly fixed on each side of the stream. The footway consists of short straps of wood secured by wires, and is protected by a wire railing on each side. To prevent the great lateral pressure from wind, wire ropes have been fixed to the centre of the bridge and secured to the sides, so that as much rigidity as possible would be given to the structure. Great difficulty was experienced in building a suitable bridge, as all the materials had to be transported on horseback for four miles. The structure which has now been erected is both strong and elegant, and, if properly protected from rust, will stand for many years. The architect was Mr. Douglas Taylor, Hawick.

Newcastle Jubilee Exhibition for 1887. Mr. William Glover, vice-president of the Northern Architectural Association, and the architect for the Jubilee Exhibition at Newcastle, has submitted his plans of the edifice to the Town Improvement Committee, and after explanation and commendation they were passed. The main entrance in the North-court, to be constructed of three 50 ft. spans, will be on the North-road, just beyond the end of the Bull Park wall. The height of the centre span will be 40 ft., and the two side spans will be 35 ft. to the apex. The two side courts will each have a central avenue, 50 ft. wide, and two side avenues, 20 ft. The South Court will be similar, and the whole will thus form a square, enclosing an area of about 2¼ acres, which will be laid out as a garden and recreation-ground, with a band-stand in the centre. At the four angles there will be refreshment-buffets and dining-rooms, concert and art saloons will be placed south of the South Court. About three acres to the north of the Exhibition-buildings are reserved for mining operations and exposed exhibits, the grounds being connected with the ornamental lake. It is expected that the buildings will be in the hands of the contractors within a month. The date fixed for the opening is her Majesty's birthday, May 24th, 1887.—*Newcastle Daily Leader.*

Obituary.—The death is announced of Mr. H. H. Fulton, M.Inst.C.E., who was formerly a pupil of his father. The latter, after practising in Great Britain for many years with Messrs. Rennie & Telford, became chief engineer to the States of North Carolina and Georgia, U.S.A. At the death of his father the late Mr. Hamilton H. Fulton became a pupil of the late Sir John Rennie, and was afterwards for years his principal assistant, and aided him in carrying out some of his numerous and most important undertakings, including the improvement of the river Nene navigation, and the river Ouse outfall navigation. Mr. Fulton was elected a member of the Institution of Civil Engineers in the year 1845. In the year 1853 an Act was obtained upon the plans designed by Mr. Fulton, for the construction of the West London and Crystal Palace Railway, a line from the London and South Western (Windsor and Richmond line) to the Crystal Palace Park, a distance of about 5¾ miles. The works with branch line to the London and Brighton line at Norwood, and to the Chelsea suspension-bridge, were subsequently carried out from beginning to completion by Mr. Fulton. In the year 1855, the Stokes Bay Railway and Pier Company obtained an Act to extend the London and South Western Railway from Gosport to Stokes Bay, with a pier to enable passengers to land at all times of the tide. The works were designed and carried out by Mr. Fulton, who was also associated as engineer with several other railway and dock works. During the past sixteen years Mr. Fulton has been prominent before the public in connexion with the Manchester Ship Canal project. In the year 1870, he made a preliminary survey and report upon the practicability of improving the rivers Mersey and Irwell so that ocean-going steamers might reach Manchester.

Sale of Building Sites at Southend.—On Saturday last, Messrs. Baker & Sons offered for sale, at the Royal Hotel, Southend, fifty-two plots of freehold building land, forming a portion of the propery known as the North Meadow Estate. The several plots offered have frontages averaging 18 ft. each, and depths of 90 ft., the sites being described as eligible for the erection of villa residences. There was a very large attendance. Mr. Baker, in submitting the property, adverted to the increasing popularity of Southend as a sea-side resort, which had within the last few years been greatly improved by the erection of high-class residences facing the sea, and the construction of an esplanade and parade upwards of a mile in length. The estate he was about to offer was advantageously situated, about the centre of the north side of the town, with a wide and convenient carriage-road direct to the beach and esplanade. He observed that the new line which the London, Tilbury, and Southend Company was now constructing between Barking and Pitsea would materially reduce the distance between London and Southend, while the Great Eastern Company would shortly have access to Southend by the line which that Company was now making between Brentwood and the first-named town. These additional means of access to Southend would doubtless be followed by a great increase in the value of building land at Southend within a very short time. The auctioneer having announced that every plot would be submitted without reserve, the sale proceeded, when the whole of the lots were sold at prices varying from 20*l.* to 29*l.* each, two corner plots, having frontages of 35 ft. each, realising 39*l.* and 33*l.* respectively. Several of the purchasers took as many as five and six lots each.

Syon House.—A smoke nuisance here from the chimneys of some lower buildings among the offices, from which in certain winds the smoke was directed against the windows of some of the principal rooms on the upper story, has been thus dealt with by Messrs. Verity: a syphon has been fitted to the offending chimneys, continued by a 15-in. galvanised iron tube down the side of the building. Two annular waterspray jets are fixed, one near the syphon, and the other some distance below, which direct the smoke down this shaft, and by the action of the waterspray precipitate all the floating particles of soot, leaving only the lighter portions of the smoke to be disposed off. This courses along the main drain, and what remains is finally extracted by an exhaust head (worked by a fine jet of water placed at the outfall of the sewer a quarter of a mile from the mansion).

Indian Railways and the Famine Difficulty.—Before the introduction of railways, freights in England were 13½d. per ton per mile. Grain is now carried from Agra to Bombay at ·442d. per ton per mile, and from Agra to Calcutta at ·388d. Mr. Hunter stated before the Parliamentary Committee that two bullocks carry two-thirds of a ton 13 miles a day. Taking this estimate, one train carrying 200 tons 13 miles would do the work of 600 bullocks, and one train carrying 200 tons 400 miles in a day does the same work as 600 bullocks in a month. We have had famines in Bundelkund, when grain at one of the greatest grain centres, Chatisghur, distanced only 300 miles, has been rotting on the ground. Suppose such to occur again, and that Government undertook, as they are bound to undertake, to feed the starving people, it would require 166,152 bullocks and 83,076 drivers, to place 2,400 tons of grain into Bundelkund from Chatisghur, and this with a single-line railway would be done with ease. These 2,400 tons would (allowing 1½ lb. for each soul) feed 3,570,666, only a fraction of the millions affected in the famines of 1877-78. During that fearful period no less than four millions died for want of food. Would it be practicable to supply and keep going 83,076 carts in a famine-stricken country? To fill up gaps at least another 20,000 would be required, making in all, in round numbers, 100,000 drivers and 200,000 bullocks,—enough to create a famine rather than help it.—*Indian Engineer.*

Wood Wool.—For some time past attention has been directed to a very interesting product, consisting of extremely thin and slender shavings of wood which are comparable to paper cut for packing. It is known by the name of "wood wool." This product was first introduced into France as a packing material. It weighs about 40 or 50 per cent. less than the materials generally used for such a purpose. Its beautiful appearance, its fineness, and its extreme cleanness, at once brought it into favour with shippers. It was afterwards found that the material was well adapted for the manufacture of mattresses, for litter for cattle, for the filtration of liquids, and for stuffing horse-collars, &c., the most suitable species of wood being selected for each of these purposes. Its elasticity causes it to be considered as the best material for bedding after horsehair, and it is even preferable to any other substance when it is derived from resinous wood, since it does not then absorb moisture. In workshops, wood wool is tending to replace cotton waste for cleaning machinery, and it has likewise found an application on the rolling stock of railways for lubricating car-axles. While it has the same property which cotton waste has of absorbing oil, it costs ten times less than that material. Its use is said to be rapidly growing in Austria and Germany, and also in France.—*Iron.*

Value of Building Land on Hayling Island.—The value of building land on Hayling Island, Hampshire, a short distance from Portsmouth, appears to be greatly increasing. Last week a sale took place at the Royal Hotel, South Hayling, of a portion of the Eastoke Estate, immediately facing the sea. The property was offered in forty-five lots, having frontages of from 80 ft. to 90 ft., with depths varying from 150 ft. 200 ft. There was a large attendance at the sale. Mr. H. R. Trigg, the auctioneer, before inviting biddings adverted to the increasing popularity of Hayling Island as a sea-side resort, and observed that the projected railway across Langston Harbour would greatly enhance the value of the property he was about to offer by giving it easier access to Portsmouth and Southsea. He added that the value of land on the Island was daily increasing, in proof of which he stated that he recently sold a plot for 560*l.* which was purchased only three years since for 210*l.* The sale then proceeded, when the bidding became very active, and a large number of plots were sold at prices ranging from 75*l.* to 80*l.* each, six plots immediately facing the sea, realising 100*l.* each, and about 300*l.* per acre, the auctioneer remarking that the land was not long ago purchased for 70*l.* an acre. He announced that a further sale would shortly take place.

Appointment.—Mr. Harry Lloyd, of Crowthorne, has been appointed Surveyor and Sanitary Inspector for the parishes of Sandhurst, Bracknell, Easthampstead, Winkfield, and Binfield. The salary is 110*l.*, and the number of candidates was eighty-three.

New Steam Flour Mill, Silloth.—Rapid progress has been made during the past two months with the erection of Messrs. Carr & Company's extensive fire-proof steam flour-mills, at Silloth, under the superintendence of Mr. T. Taylor Scott, A.R.I.B.A., architect, Carlisle, an average of over 100 men having been at work day and night for six mouths. The buildings cover a very large area of ground on the north side of the new dock, and present a substantial and handsome appearance towards the town. The two main buildings, 186 ft. long by 97 ft. broad, are now 25 ft. above the ground, and about 40 ft. more has to be added before the total height is reached. When completed it will be one of the best and most substantial mills of its class that has been erected in this country, as all the latest improvements have been introduced by the architect, and everything is being carried out in the best possible manner.—*West Cumberland Times.*

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	5	0	7	0	0
Teak, E.I. ....load	9	0	0	14	0	0
Sequois, U.S.....foot cube	0	2	4	0	2	7
Ash, Canada ....load	3	0	0	4	10	0
Birch ,, ...load	2	10	0	4	0	0
Elm ,, ...load	3	10	0	4	10	0
Fir, Dantsic, &c. ....load	1	10	0	4	0	0
Oak ,, ...load	2	10	0	4	10	0
Canada ....load	3	0	0	6	0	0
Pine, Canada red ....load	2	0	0	3	10	0
,, yellow ....load	2	5	0	4	0	0
Lath, Dantsic ....fathom	3	0	0	5	0	0
St. Petersburg ....load	4	0	0	5	10	0
Wainscot, Riga.....log	2	15	0	4	0	0
,, Odessa, crown ....load	3	5	0	3	7	6
Deals, Finland, 2nd and 1st...std. 100	7	0	0	8	0	0
,, 4th and 3rd ....std. 100	6	0	0	7	0	0
Riga ....std. 100	5	10	0	7	0	0
St. Petersburg, 1st yellow ....std. 100	8	0	0	14	0	0
,, 2nd ,, ...std. 100	7	0	0	8	0	0
,, white ....std. 100	7	0	0	10	0	0
Swedish ....std. 100	6	0	0	15	0	0
White Sea ....std. 100	7	0	0	17	10	0
Canada Pine, 1st ....std. 100	17	0	0	30	0	0
,, 2nd ....std. 100	12	0	0	17	0	0
,, 3rd, &c. ....std. 100	6	0	0	10	0	0
,, Spruce 1st ....std. 100	8	0	0	11	0	0
,, 3rd and 2nd ....std. 100	5	0	0	7	10	0
New Brunswick, &c....std. 100	5	0	0	7	0	0
Battens, all kinds ....std. 100	4	0	0	12	0	0
Flooring Boards, sq. 1 in., Prepared, first ....sq.	0	9	0	0	13	0
Second ....sq.	0	7	6	0	8	6
Other qualities ....sq.	0	5	0	0	7	0

TIMBER (*continued*).	£.	s.	d.	£.	s.	d.
Cedar, Cuba.....foot	0	0	3	0	0	3½
Honduras, &c. ....foot	0	0	2½	0	0	3½
Australian ....foot	0	0	2	0	0	3
Mahogany, Cuba ....foot	0	0	4	0	0	7
St. Domingo, cargo average ....foot	0	0	4	0	0	7
Mexican ,, ...foot	0	0	3½	0	0	4½
Tobasco ,, ...foot	0	0	4	0	0	6½
Honduras ,, ...foot	0	0	4½	0	0	6½
Maple, Bird's-eye....foot	0	0	6	0	0	8
Rose, Rio ....ton	7	0	0	10	0	0
Bahia....ton	6	0	0	10	0	0
Box, Turkey ....ton	5	0	0	17	0	0
Satin, St. Domingo ....foot	0	0	7	0	0	11
Porto Rico ....foot	0	0	8	0	1	2
Walnut, Italian ....foot	0	0	4	0	0	5

METALS.						
Iron—Pig, in Scotland ....ton	0	0	0	0	0	0
Bar, Welsh, in London....ton	4	7	6	4	15	0
,, ,, in Wales ....ton	4	2	6	4	7	6
,, Staffordshire, London ....ton	5	10	0	6	0	0
Sheets, single, in London....ton	6	15	0	8	10	0
Hoops ,, ...ton	6	0	0	7	0	0
Nail-rods ,, ...ton	5	10	0	6	10	0
Copper—						
British, cake and ingot ....ton	42	0	0	43	0	0
Best selected ....ton	42	10	0	43	10	0
Sheets, strong....ton	47	0	0	48	0	0
,, India ....ton	44	10	0	45	10	0
Australian ....ton	0	0	0	0	0	0
Chili, bars ....ton	39	7	6	39	15	0
Yellow Metal....lb.	0	0	3½	0	0	4½
Lead—						
Pig, Spanish ....ton	12	16	3	12	17	6
English, common brands....ton	13	5	0	0	0	0
Sheet, English ....ton	14	10	0	0	0	0
Spelter—						
Silesian, special ....ton	14	2	6	0	0	0
Ordinary brands ....ton	13	15	0	14	0	0
Tin—						
Banca ....ton	0	0	0	0	0	0
Billiton ....ton	0	0	0	0	0	0
Straits ....ton	98	15	0	0	0	0
Australian ....ton	99	10	0	0	0	0
English ingots....ton	102	0	0	0	0	0
Zinc—						
English sheet ....ton	18	0	0	18	5	0

OILS.						
Linseed ....ton	22	5	0	22	10	0
Cocoanut, Cochin ....ton	32	10	0	33	0	0
Ceylon ....ton	25	15	0	0	0	0
Copra....ton	0	0	0	0	0	0
Palm, Lagos ....ton	23	0	0	23	10	0
Palm-nut Kernel ....ton	0	0	0	0	0	0
Rapeseed, English pale....ton	21	15	0	22	0	0
,, brown ....ton	20	5	0	20	7	6
Cottonseed, refined ....ton	19	0	0	20	0	0
Tallow and Oleine ....ton	25	0	0	45	0	0
Lubricating, U.S. ....gal.	0	0	0	10	0	0
,, Refined ....gal.	8	0	0	13	0	0
Turpentine—						
American, in casks....cwt.	1	6	6	1	6	9
Tar—Stockholm ....barrel	0	15	0	0	15	6
Archangel....barrel	0	10	6	0	11	0

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITIONS.

Nature of Work.	By whom required.	Premium.	Designs to be delivered.	Page.
School Buildings	Sunderland School Brd.	50*l.*, 20*l.*, and 10*l.*	Sept. 25th	ii.
Public Hall, &c.	Lewes Town Council	20*l.* and 5*l.*	October 9th	ii.
New Municipal Buildings	City of Edinburgh	250*l.*, 150*l.*, and 100*l.*	Dec. 31st	ii.
Statue of late Earl of Dudley	The Memorial Com.	Not stated	Not stated	ii.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Sewerage Works	Exmouth Local Board	E. Cousins & Son	August 24th	ii.
Block of Buildings	Prudential Assur. Co.	A. Waterhouse	August 25th	ii.
Main Sewers, Manholes, Lampholes, &c.	Epping R.S.A.	E. Egan	August 26th	ii.
Hospital, &c.	Tonbridge R.S.A.	H. H. & C. Cronk	August 27th	ii.
Construction of Harbour, &c.	Cart Navigation Trus.	Miller & Bell	August 31st	ii.
Painting and Repairing Workhouse	Paddington Vestry	A. & C. Harston	Sept. 1st	xii.
Pipe Sewers, &c.	Bromley U.R.S.A.	A. Williams	Sept. 2nd	ii.
Construction of Reservoir	Farnham Water Co. Lim	Pollard & Forder	Sept. 3rd	ii.
Paving, Sewering, and Making-up Road, &c.	Beckenham Local Brd.	G. B. Carlton	Sept. 6th	ii.
Fireproof Floor, Iron and Glass Roof, &c.	St. Marylebone Public Baths and W. Com.	J. Waldram	Sept. 7th	ii.
Wrought-Iron Bridge, &c.	Condover Highway Brd.	J. W. Hoult	Sept. 9th	xii.
New Coast Guard Station and Battery	Admiralty	*Official*	Sept. 10th	ii.
Construction of Approach Road, &c., Swansea	Sir R. Mansell	Walton & Lee	Sept. 13th	xii.
Engineering Work	St. Mary Abbott's Public Baths and W. Com.	T. Verity	do.	ii.
Granite Carriageways & York Stone Footways	Met. Board of Works	*Official*	Sept. 23rd	ii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Town Surveyor	Lowestoft Town Council	250*l.*	Sept. 3rd	xvi.
County Surveyorships in Ireland	Civil Service Com.	Not stated	Sept. 10th	i.
Assistant Surveyor	do.	do.	Sept. 21st	xvi.

TENDERS.

CHISWICK.—For Woodstock-road, for the Chiswick Local Board. Mr. A. Ramsden, surveyor:—

Nowell & Robson	£920 0 0
Mowlem & Co.	755 0 0
G. Alldred	720 7 9
Ball	691 7 2

CHELSEA.—For alterations and extensions at Nos. 16 and 18, King's-road, for Messrs. Lester & Co. Mr. J. William Stevens, architect and surveyor, New Bridge-street:—

Burton & Son	£927 0 0
Downs	795 0 0
Prestige & Co.	724 0 0
Yardly & Son	722 0 0
Braid & Co. (accepted)	650 0 0

CROYDON.—For house at Kenley, near Croydon. Mr. Robert Ridge, architect, Katharine-street, Croydon:—

Bray, Shirley	£478 0 0
Marriage, Croydon	467 0 0
Page, Croydon	457 0 0
Churchill, Godstone	353 0 0
Bullock, Croydon	334 0 0
Quittenden, Warlingham	333 0 0
Smith & Bulled, Croydon	297 0 0

ENFIELD.—For iron pipes for the Enfield Local Board. Mr. W. Kitteringham, surveyor to the Board:—
Phœnix Company, Derby, accepted, at 4*l.* 4*s.* per ton.
[Twenty-four tenders submitted.]

GRAYS.—For the erection of coffee-tavern at Grays, Essex, for the Grays and District People's Café Company. Mr. F. T. Mullett, architect:—

Thompson & Son, Grays	£1,148 5 0
Elliot, Newbury*	1,090 0 0
Page, Croydon	1,080 0 0
Seed, Kentish Town	990 0 0
J. Brown, Grays	982 6 0
Staines & Son, London	975 0 0
Prentis & Co., Grays	950 0 0
Snow, New Brompton	933 1 0
H. J. Carter, Grays	849 10 0
G. & H. Rous, Grays	837 0 0

* Rejected, before opening tenders, on account of his removing the drawings off the premises away from the other builders.

HANWELL.—For works at Hanwell, as advertised. Quantities by Messrs. Fowler & Hugman, Craig's-court, Charing Cross:—

Holloway Bros., Battersea	£3,596 0 0
Nightingale, Lambeth	3,520 0 0
Kirk & Randall, Woolwich	3,420 0 0
G. Lyford, Uxbridge-road	3,393 16 9
T. Simpson, Rotherhithe	3,371 0 0
J. Edwards, Ealing	3,277 0 0
E. C. Howell & Son, Lambeth	3,249 0 0
J. A. Wilson, Uxbridge	3,198 0 0
W. Martin, Willesden Green	3,170 0 0
Pack Bros., Brixton-road	3,089 0 0
Stephenson, Bishopsgate-street Without	3,030 0 0
Johnson, Wandsworth Common	2,950 0 0
Kirk Bros., Battersea	2,940 0 0
A. Kimberley, Banbury	2,930 0 0
A. Clissold, Ealing	2,834 0 0
H. C Belch, Slough	2,756 12 4
G. Gibson, Southall	2,663 0 0
J. L. Green, Chelsea	2,548 0 0

[Not decided.]

HATFIELD.—For new chancel, organ-chamber, and vestry to the Church of St. Mary, at Hatfield, Herts. Mr. H. Hardwicke Langston, architect, Great James-street, Bedford-row, London. Quantities supplied:—
Contract No. 2.—Superstructure.

		Old Materials.
Nightingale, London	£2,499	£9
Harris & Wardrop, London	2,497	8
Falkner, London*	2,475	7
Ekins & Son, Hertford	2,262	2

* Accepted, subject to certain deductions.

KENSINGTON.—For making up two roads (Ashburn-place and Philbeach-gardens), for the Kensington Vestry. Mr. H. Weaver, surveyor:—

	Ashburn-place.	Philbeach-gardens.
J. Neal	£120	£485
Felton	123	473
Rogers & Dickens	115	470
J. Mears	117	460
Nowell & Robson	110	450
Mowlem & Co. (accepted)	97	351

KENSINGTON.—For alterations at 8, Gledhow-terrace, Kensington, for Mr. Phillips. Messrs. Beaumont, Sergeants' Inn, Fleet-street:—

Simmonds & Co.	£665 0 0
Drew & Cadman	590 0 0
Toten & Sons	580 0 0

KIMBLE MARSH.——For the erection of new farm-house and cowsheds at Kimble Marsh, near Aylesbury. Mr. Arthur Vernon, F.S.I., architect, Great George-street, Westminster and High Wycombe:—

	For Farmhouse.	For Cowsheds.
Grist	£308 10 0	£100 0 0
Gibson (accepted)	268 0 0	103 10 0

LONDON.—For rebuilding No. 65, Fore-street, City, for Mr. J. Kowin. Mr. W. M. Yetts, architect, Finsbury-pavement. Quantities by Messrs. Franklin & Andrews:—

Hussey	£4,400 0 0
Green	4,096 0 0
Downs	3,855 0 0
Lawrence & Son	3,822 0 0
H. L. Holloway	3,789 0 0
Woodward	3,770 0 0
Mortar	3,701 0 0
Braid & Co.	3,469 0 0

LONDON.—For sundry alterations and repairs at 22, Dorset-street, Baker-street, for Messrs. Day, Son, & Hewitt. Mr. W. F. Potter, architect:—

R. Perkins, Marylebone	£187 0 0
H. H. Evans, Marylebone (accepted)	175 0 0
J. Hooper, Herne Hill	147 0 0

LONDON.—For rebuilding No. 52A, Bow-lane, for Messrs. Zapp & Bennett. Mr. C. Innes, architect:—

Titmas	£2,600 0 0
Rider & Son	2,541 0 0
Hearn & Co.	2,524 0 0
Bottoms Bros.	2,450 0 0
Prestige & Co.	2,313 0 0
Greenwood & Co.	2,215 0 0
Lawrence & Co.	2,098 0 0
Macey & Sons	2,073 0 0
Ramsay (accepted)	1,977 0 0

LONDON.—For building additional story and alterations at 45, Hill-street, Berkeley-square, for Dr. Robson Roose. Messrs. C. Eales & Sons, architects:—

Wilkins & Kent (accepted)	£439 0 0

LONDON.—For building the new Cutlers' Hall. Mr. T. Tayler Smith, Architect to the Company:—

NAME.	Amount of Tender.	If Joiner's Work in Dining-rooms and two Court-rooms is executed in			If Joiner's Work to Principal Staircase and Entrance Hall is executed in		
		Walnut, add	Wainscot, add	Chestnut, add	Walnut, add	Wainscot, add	Chestnut, add
Brass	£10,877	£345	£412	£412	£483	£557	£557
Chappel	10,840	550	620	480	680	740	610
Colls	11,390	360	470	400	510	630	540
Grover	10,890	1,123	1,116	1,094	835	910	915
Higgs & Hill	11,540	646	654	667	648	655	664
Lascelles	12,512	790	908	721	850	908	754
Morter	10,489	1,018	1,040	1,020	829	910	913
Mowlem	11,980	412	570	915	496	811	984
Stevens & Bastow	10,999	472	518	422	636	697	561
Stimpson	11,220	380	560	850	490	740	920

LONDON.—For rebuilding No. 136, Oxford-street, for Messrs. Hyam & Co., Limited. Messrs. Davies & Emanuel, architects. Quantities by Messrs. Karslake & Mortimer:—

	In three months.	In four months.
G. S. S. Williams & Son	£3,850	£3,650
J. Mowlem & Co.	—	3,394
Rider & Sons	3,636	3,386
G. Trollope & Sons	—	3,278
J. Grover & Son	3,442	3,242
W. Brass & Son	3,300	3,212
Cubitt & Co.	—	3,158
Colls & Sons	3,218	3,118
E. Lawrance & Sons (accepted)	3,131	3,031

LONDON.—For alterations and repairs to No. 8, Half Moon-street, Piccadilly, for Miss Searle. Mr. J. T. Wimperis, architect:—

W. & E. Curtiss	£877	0	0
Lee	777	0	0
Bush	725	0	0

NEW BROMPTON (Kent).—For a new road, for the British Land Company, Limited, on their estate at New Brompton. Mr. Henry B. Michell, surveyor:—

J. Jackson, Leyton	£620	0	0
E. Wilson, Walthamstow	555	0	0
J. Bloomfield, Tottenham	455	0	0
J. Pizzey, Hornsey	435	0	0
W. Harris, Camberwell	416	0	0
C. Killingback, Camden Town	384	0	0
J. Trueman, Hackney	339	0	0
Peill & Sons, Bromley, Kent*	328	0	0

* Accepted.

QUARRENDON.—For the erection of a new farm-house and buildings, Quarrendon, near Aylesbury. Mr. Arthur Vernon, F.S.I., architect, Great George-street, Westminster, and High Wycombe:—

Gibson	£1,483	0	0
Grist	1,198	0	0

ROMFORD.—For rebuilding the Woolpack public-house, and for shop adjoining, High-street, Romford, Essex, for Messrs. Ind, Coope, & Co. Mr. John Hudson, architect, Leman-street, E. Quantities by Mr. C. Stanger:—

Holland & Hannen	£4,244	0	0
W. Brass & Son	3,036	0	0
J. & J. Greenwood	3,001	0	0
Brown, Son, & Blomfield	2,980	0	0
J. Bentley	2,912	0	0
Hammond & Son, Romford*	2,861	0	0

* Accepted.

SEVENOAKS.—For building new Baptist church, The Vine, Sevenoaks. Mr. John Wills, architect, Derby:—

Roberts, Norwood	£3,796	0	0
Martin, Eastbourne	3,035	0	0
Dobson, Colchester	2,768	0	0
King, Dover	2,760	8	0
Bowyer, Norwood	2,730	0	0
Denne & Son, Deal	2,698	0	0
Allen & Sons, Kilburn	2,675	0	0
Snow, West Brompton	2,621	0	0
Wiltshire, Sevenoaks (accepted)	2,620	0	0
Staines & Son, London	2,597	0	0
Cornwell & Son, Eastbourne	2,562	15	0
Owen, Sevenoaks	2,500	0	0
Hodges, Sevenoaks	2,460	0	0
Beale, Battersea	2,387	0	0

WALLINGTON.—For the erection of a Baptist church in the Queen's-road, for the trustees. Mr. Henry J. White, architect, Wallington, Surrey:—

E. J. Burnand	£4,117	0	0
Coxhead	4,063	0	0
Smith & Son	3,973	0	0
W. H. Castle	3,827	0	0
Allen & Son	3,817	0	0
D. Brown & Co.	3,790	0	0
D. Stewart	3,468	0	0
R. Humphries, Sutton	3,220	0	0

WESTMINSTER.—For the erection of a bakery, offices, and shops, at Horseferry-road, Westminster, for the Civil Service Bread Company (Limited), 107, Cannon-street. Mr. W. F. Mason, engineer, Longsight, Manchester. Quantities by the engineer:—

Wall Bros.	£17,979	0	0
G. Shaw	17,890	0	0
H. L. Holloway	17,742	0	0
J. & J. Greenwood	17,400	0	0
Colls & Sons	16,800	0	0

SPECIAL NOTICE.—Lists of Tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, W.C., *not later than Four p.m.* on THURSDAYS.

PUBLISHER'S NOTICES.

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DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

SPECIAL.—ALTERATIONS in STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same, must reach the Office before TEN o'clock on WEDNESDAY mornings.

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TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, and New Zealand, 26s. per annum. To India, China, Ceylon, &c. 30s. per annum. Remittances payable to DOUGLAS FOURDRINIER, Publisher, No. 46, Catherine-street, W.C.

TO CORRESPONDENTS.

Registered Telegraphic Address, "THE BUILDER, LONDON."

G. R. T.—H. J. & Son.—M. (there is not the slightest ground for your insinuation, and the competitors referred to are quite above taking any such steps to recommend themselves to an assessor)—W. G.—C. & C. (thanks)—J. G. K. (shall appear)—J. F. D.—A. B.—E. S. (shall have consideration)—J. B.—T. & G. H.—C. T.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

Best Bath Stone.

WESTWOOD GROUND,
Box Ground, Combe Down,
Corsham Down,
And Farleigh Down,
RANDELL, SAUNDERS, & CO., Limited,
Corsham, Wilts. [ADVT.

Bath Stone.

BEST QUALITY OF ALL KINDS.

PICTOR & SONS,
BOX, WILTS. [ADVT.

Doulting Freestone and Ham Hill Stone of best quality, in blocks, or prepared ready for fixing. An inspection of the Doulting Quarries is respectfully solicited; and Architects and others are CAUTIONED against inferior stone. Prices, delivered to any part of the United Kingdom, given on application to CHARLES TRASK & SONS, Norton-sub-Hamdon, Ilminster, Somerset.—Agent, Mr. E. WILLIAMS, No. 16, Craven-street, Strand, W.C. [ADVT.

Doulting Free Stone
HAM HILL STONE,
BLUE LIAS LIME
(Ground or Lump),
For prices, &c., address S. & J. STAPLE, Quarry Owners, Stone and Lime Merchants, Stoke-under-Ham, Ilminster. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, granaries, tun-rooms, and terraces. [ADVT.

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
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Office:
No. 90, Cannon-street, E.C. [ADVT.

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Self-Acting "FALL DOWN" GATE STOPS,
and IMPROVED GATE FITTINGS of every Description
36A, BOROUGH ROAD,
LONDON, S.E.
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GOLD AND SILVER MEDALS AT AMSTERDAM EXHIBITION.
IRON CISTERNS.
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LONDON, LIVERPOOL, GLASGOW.
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